Socioeconomic determinants of protein health essay

Health & Medicine

Dare AKERELE1; Mohammed Kebiru IBRAHIM2; Samuel Ayodele ADEWUYI11Department of Agricultural Economics and Farm Management, Federal University of Agriculture, Abeokuta, Nigeria, PMB 2240, Abeokuta, Ogun State, Nigeria2Department of Agricultural Economics and Extension, Kogi State Univesity, Anyigba, PMB 1008, Anyigba, Kogi State, Nigeria

ABSTRACT

The study investigated the problem of malnutrition among Nigerian households with emphasis on protein and calorie intake. Multistage random sampling approach was used to select 321 household members drawn from a total of 80 households. The study revealed that household income, dependency ratio, education and gender of household head, among others, are factors that would significantly influence per capita daily calorie and protein intake of households. Protein-energy malnutrition is more of inadequate calorie than protein intake. There was confirmatory evidence of inadequate consumption of calorie among pre-school and school age children while adult male members seemed to consume above requirements with the possibility of being at the risk of obesity. Though children were undernourished, they are unlikely to be marasmic. This study recommends, among others, nutrition education programme and campaigns to raise awareness on the nutritional needs of household members and the need for fair distribution of food within the household. Policies aimed at improving household income, employment generation and efforts to enhance women status are also advocated for the reduction of protein energy malnutrition.

Key word: malnutrition, protein, calorie, determinants, obesity

INTRODUCTION

Nutrients from food are fundamental human needs that remain unachieved among vast majority of the people worldwide. The lack of such nutrients and their associated debilities are profound and felt more by poor households in developing countries and among disadvantaged grouped such as children and women. Ensuring adequate nutrition is arguably the most critical of human capital investment as its sufficiency in terms of stock and flow is inevitable for human survival. Malnutrition can be referred to as a state of nutrition whereby inadequate or excess supply of energy, protein and/or other nutrients leads to debilitating effects on human tissue or body cells- undermining their functions and clinical outcomes (Elia 2003). Malnutrition may occur as over- nutrition or under-nutrition. Under-nutrition can manifests in the form of protein-energy malnutrition which arises due to inadequate supply of protein and energy to the body and as micro nutrient deficiencies. Over-nutrition on the other hand is associated with excessive intake of food above body requirements - most especially food calories. Severe health conditions such as Obesity, diabetes and hypertension are known offshoots of over-nutrition. Geographical spread of malnutrition indicates that over seventy percent of malnourished[1]children are found in Asia; approximately twenty-six percent are situated in Africa and four percent are located in Latin American and Caribbean regions (World Hunger Education Service (WHES 2011). The nutritional plight (predicament) of these children in many instances begins from their mothers. It is more likely that malnourished mothers would give birth to malnourished children. Under-nutrition (underweight) among women of child-bearing age in developing

countries especially in Africa and South Asia increases the risk of low birth weights of infants born yearly (Blössner and de Onis 2005). Apart from neonatal deaths, under-nutrition also causes learning disabilities, poor health, poor cognitive ability, blindness, retarded growth, premature death (WHES 2011) and other related illness. Malnutrition in the early stage of life affects adult productivity and labour earnings throughout the lifespan of the sufferer. Malnourished children would have to cope with compromised health as deviations created at childhood are often difficult to revert in adulthood. Available statistics show that the problem of protein-energy malnutrition in Nigeria is widespread. The levels of food calorie and protein supplied or consumed by most Nigerians over the years have been below the minimum recommendations. Approximately 41. 0 percent of the population of Nigeria is food insecure with 16 percent experiencing severe undernourishment (Olayemi 1996). According to World Bank, the malnutrition prevalence among children under the age of five in Nigeria was reported at 41% in 2008 with life expectancy at birth put at 43. 83 years in 2005 by the CIA (CIA 2005; World Bank 2012). Low income rural and semi-urban dwellers in Nigeria consume less than 60 percent of their energy and 40 percent of their protein needs (International Conference on Nutrition (ICN), 1992). As much as 79. 0 percent of low-income urban households and approximately 71. 0 percent of rural households in Nigeria were food insecure and would have to increase daily intake of calorie by 23. 0 percent and 25. 0 percent of the minimum recommended daily allowance respectively to be able to meet their daily calorie requirements (Orewa and Iyagbe 2010). In terms of protein intake, barely 25. 0 percent of low-income urban households and 19. 6

percent of rural households were able to meet their daily protein intake requirements in Nigeria (Orewa and Iyangbe 2009a). While under-nutrition is more pronounced in developing countries, empirical studies have also shown that over-nutrition and under nutrition may co-exist within the households - either rich or poor. There are cases where certain members of the household were undernourished while other members consumed food in excess of their requirements. Even when the average food (calorie) available at the household level could sufficiently satisfy the needs of individual members, women and children may still receive inadequate food calories (Quisumbing and McClafferty 2006). For instance, Akerele (2011) found disparities in food distribution among members of household in South- West Nigeria. His findings suggested that adult male members of the households received fairer share of food than other members of the household. He also found while that adult males and adolescent females consumed food calorie in excess of their requirements other household members consumed below their recommended calorie intakes. The burdens of calorie inadequacy were felt more by the school age children, male adolescent and adult female members. He was of the opinion that the disparities in food distribution might be intentional as the substantial portion of food was biased in favour of adult male members. While some scholars have argued that inequalities in food allocation within the households could be due to discrimination, favouritism or the perceived economic values such member or his/her contributions (Gittelsohn and Vastine 2003) to the general household welfare, others opined that that the disparity could be unintentional. Disproportionate food allocation in such situation is occasioned by lack of

knowledge of the nutritional requirements of members (World Food Programme (WFP 2010). Notwithstanding the line of argument, what is undeniable is the issue of differential food allocation patterns and by extension the possibility of under-nutrition and over-nutrition coexisting within the household. Hence, focusing a serious look on the food consumption and potential risk of malnutrition within the household cannot be over emphasized in the fight against malnutrition and its related diseases. The first step towards designing and targeting of nutrition intervention would therefore be to identify the most vulnerable groups or potentially at risk groups. This is achievable when there is adequate information about the food nutrient consumption differentials among household members, the influence of household socioeconomic factors on nutrient intake and proper understanding of the types and dimensions of malnutrition being experienced by members within the households. Though inadequate access to food is not the only cause of malnutrition, food and nutrient consumption appear to be the most critical factors[2]. Furthermore, protein-energy malnutrition has been identified as the most lethal of all forms of malnutrition and hunger especially in developing countries. This possibly justifies why nutritionists and other development scholars have focused more attention on protein-energy malnutrition while discussing issues of global malnutrition and hunger (WHES 2011). The study therefore sought to examine the nutritional status of household members and the distribution of risk of malnutrition within the households in the study area with main emphasis on protein and calorie intake. Specifically the study seeks to answer the following questions. Do household members have adequate

intake of calorie and protein? What socioeconomic factors influence their intake levels? Are there probable indications of protein- energy malnutrition (over and under nutrition) among households members? What is the nature and distribution among household members?

METHODOLOGY

Study Area

The study was carried out in Ado- Ekiti, Ekiti State in the South-Western part of Nigeria. The state has a total population of about 2, 384, 212 million (National Population Commission (NPC) 2006). It is located between latitude 70 151 and 80 071 North of the equator and longitude 40 471 and 50 451 East of the Greenwich meridian. The study area is located in the rain forest agro-ecological zone. It has a mean annual temperature of about 270C and a mean annual rainfall of about 1400mm. It has a vast agricultural land suitable for production of major staples such as producer rice, cassava, cocoyam, plantain, yam, and maize. It also endowed with lowland areas useful for farming during the dry seasons. The inhabitants of the study area are predominantly Yorubas but there are other ethnic groups living together with the people of the state. Dwellers in the study area are mainly civil servants as well as those with private establishments who are also engaged in agriculture for their livelihoods.

Sampling procedure and data collection

The study employed a multistage sampling technique to select eighty households comprising 321 household members in the study area. Five out of the thirteen political wards were randomly selected in the first stage. This

was followed by another random selection of two streets from each of the political wards selected in the first stage. This made up a total number of ten streets. In the third stage, 8 houses were selected from each of the 10 streets through systematic random sampling techniques. This summed up to a total of eighty houses. In the last stage, one household was purposively selected from each of the eighty houses to make a total of eighty households. A well- structured questionnaire was used to elicit information through personal interview. The questionnaire used for the study was approved by the post graduate supervisory committee of the Department of Agricultural Economics and Farm Management, University of Agriculture, Abeokuta, Nigeria. Prior to the interview, informed consent was obtained from each respondent (subject) or the parent(s) of respondent should the respondent is a child. The interviews were conducted for the heads of households alongside other household members. Where members such as children could not provide reliable food consumption information, adult members who served the meals were required to supply the information. Each of the households in the study was visited twice (fortnightly) in a month over a period of two months for the interview. The 24-hour dietary recall approach was used to collect food intake data on individual members of households. Data were also collected on household monthly income, monthly food expenditure, household size, gender, age, occupation, educational level and number of dependants.

Methods of Data Analysis

Data collected were subjected to descriptive statistics such as frequency and percentages tables as well as inferential analyses such as the Ordinary Least

Square multiple regression. Calorie and protein contents of food were estimated using the Nutrient estimation techniques.

Estimation of calorie and protein intake of household members

The techniques for estimating the calorie and protein intake of individual household member derives from (Aromolaran 2004; Ayinde et al. 2006; Akerele 2011). The calorie and protein conversion factors used were obtained from the food composition tables developed for Nigeria (Oguntona and Akinyele 1995). The calorie and protein intake estimation formula are stated below:..... (1) ..... (2)Ci = mean daily calorie intake level of household member i. Ais= total weight (in gram)Pi = mean daily protein intake level of household member i. Ais= total weight (in gram) of food commodity s consumed (using the 24-h dietary recall method) in all the four visits by individual i. Bs= standardized food energy content per 100g of food commodity s. V= number of visits (V = 4) and m= total number of food commodity consumed by household member i.

Calorie and protein intake function

The household per capita calorie and protein intake function was estimated with the Ordinary Least Square regression model. The model was used to analyse the influence of some socioeconomic variables on household per capita daily intake of calorie and protein in the study area. The calorie and protein models are specified below:

Calorie intake function

C = β0 + β0 X1 + β0 X2 + β0 X3 + β0 X4 + β0 X5 + β0 X6 + β0 X7 + β0 X8+ e

Protein intake function

P= β0 + β0 X1 + β0 X2 + β0 X3 + β0 X4 + β0 X5 + β0 X6 + β0 X7 + β0 X8+ eC = Per capita daily calorie intake of the households (kcal). P = Per capita daily protein intake of the households (g), X1 = Household total monthly income (Naira)X2 = Food budget share (food expenditure as a percentage of total household expenditure)X3 = Household size (no of people)X4 = Household head age (years)X5 = Educational status of household head (in years)X6 = Dependency ratio (the ratio of those that are not gainfully employed (i. e. not earning income) to those that are gainfully employed (earning income) within the household (Akerele and Adewuyi 2011). X7 = Household head major occupation (1= salary/wage earner, 0 = non-salary earner). X8 = Gender of household head (1 = female, 0 = male)e = error term. β0 is the constant term while β1, β2,... β8 represent the coefficients associated with the explanatory variables in the respective models. The linear, semi-logarithmic, double logarithmic and the exponential forms of the protein and calorie models were estimated and the best functional form for each model was selected as the lead equation based on the econometric coefficient of multiple determination (R-square) values, significance of model F-values, statistically significant of explanatory variables and the a priori expectations regarding the signs of the coefficients of the explanatory variables. β1, β2, β5, β7 are expected to have positive signs; β3 and β6 are

expected to have negative signs while β4 and β8 could have either positive or negative signs.

RESULTS AND DISCUSSION

Household income and food budget shares

The results of household income levels and food budget shares are presented in table 1. Household income has been identified as a critical factor that influences food intake and nutritional status of people. The proportion of household income allocated to food can also provide some information regarding vulnerability of household to economic shocks and nutritional deficiencies. Poor households often spend greater percentage of their income and are highly susceptible to food insecurity and under-nutrition. Though the average per capita monthly income (N8389. 56) puts the household on approximately 2. 15 US Dollar per day, the results suggest that most of the households are poor. The results indicate that most (36. 25 percent) of the households had per capita monthly income below N2501 and spent about 61. 1 percent of their income on food. The per capital monthly household income (N2501) in the lowest income category translates approximately to 0. 64 US Dollar per day (as at the time of data collection). This finding suggests that at least 36. 25 percent of the household are poor with members likely to suffer more of protein and calorie insufficiencies.

Calorie and protein consumption Patterns among Households

The result of the per capita daily calorie and protein intake of household members are presented in tables 2 and 3. The double-logarithmic functional

form of the regression model was selected based on its R2 value and ease on interpretation of the estimated coefficients as they measure elasticities directly. Consequently, only the result of the double logarithmic form is discussed. However, results of other functional forms are presented. The F-values of both per capita daily calorie and protein intake models are significant; indicating that that all the explanatory variables jointly influence per capita daily calorie and protein intakes in each of the models respectively. The R-square value of 0. 376 from calorie intake model implies that 37. 60 percent of the variations in per caput daily calorie intake of households are accounted for by changes in the explanatory variables while R2 value of 0. 397 from protein intake model implies that 39. 70 percent of the variations in per caput daily protein intake of households are accounted for by changes in the explanatory variables. Six of the eight explanatory variables in the estimated calorie intake function (table 2) were significant while five were significant in the estimated protein intake function (table 3). The variables common to both models are household income, household size, food budget share, educational level of household head and dependency ratio with gender of household head being significant only in the calorie model. The results show that household monthly income has significant positive influence on both per capita daily calorie and protein intake; meaning that increase in household monthly income would increase both per capita daily calorie intake and protein respectively. However, the magnitude of impact differs. The coefficients of income in calorie and protein intake model are 0. 135 and 0. 956 respectively. One percent increase in monthly income of household will lead to 0. 135 percent increase in per

capita daily calorie intake but would result in 0. 956 percent increase in the per capita daily protein intake. This implies that though protein and calorie intake are both income inelastic, protein consumption would attract higher (substantial) share of an increase in household income than calorie in the study area. This finding is consistent with Bennett’s law which hypothesizes that consumers tend to allocate more income to protein foods than carbohydrates (calorie rich foods) as income increases. This is because households would tend to spend more might on food items perceived to offer better nutritive quality as they assume higher income status. The calorie-income elasticity value (0. 135) agrees with Bouis and Haddad (1992) and Aromolaran (2004) who found calorie – income elasticity below 0. 20 in contrast to the popular notion that calorie-income elasticity in developing countries ranges between 0. 4 – 0. 8. Orewa and Iyangbe (2009b) conclude that daily calorie-intake may not respond significantly to marginal rise in income among household in the country. The protein-income elasticity value (0. 956) is comparable to Iyangbe and Orewa (2009) who reported protein-income elasticity of 0. 75 among household in Nigeria. In addition, food budget share has a positive influence on both per capita daily calorie and protein intake with values of coefficient being 0. 097 and 0. 44 respectively. Hence, protein intake will increase considerably than calorie intake even with a marginal rise in the amount of money dedicated to food. In other words, households are likely to bias food consumption in favour of foods that are rich in protein as the proportion of income dedicated to the food improves; leading to increased intake of protein. In Nigeria where most households spend substantial portion of their income on food, inadequate of income

would pose a serious challenge to the nutritional status of members. Household size was also found to impact negatively on per capita daily calorie and protein intake. This implies that increase in household size has the tendency to reduce the per capita daily calorie and protein intake of household members. The coefficients of household size are 0. 304 and 0. 637 in calorie and protein models respectively; suggesting that increase in household size would lead to greater reduction in protein intake than calorie intake. This is possible especially if the increase translates to members who do not contribute to household income. Consequently, households may be compelled to trade off protein foods for more of relatively cheaper carbohydrate food stuffs in order to accommodate the energy needs of members. Hence, the greater reduction impacts on protein. The effect of the reduction in protein is about twice that of calorie. Previous studies that have found a negative relationship between nutrient intake and household size include (Iyangbe and Orewa 2009; Orewa and Iyangbe 2009b; Ayinde et al. 2010). The study also found that education level of household head influence both per capita daily calorie and protein intake but the direction of influence differs. While education status had a negative influence on per capita calorie intake, it exacted a positive influence of per capita protein intake. A possible reason for the negative influence might be that as educational level of household head increases, marginal utilities derived from additional energy diet declines up to the point where preferences of household members propel food consumption towards consumption of more proteins. This is because education had positive influence on protein intake. Dependency ratio also exacts negative influence on both per capita daily calorie and

protein intake; indicating that an increase in dependency ratio would reduce intake of both calorie and protein of household members. The impact of the reduction is higher for protein than calorie intake. The coefficients of dependency ratio are 0. 055 and 0. 234 in both calorie and protein intake models respectively. Initiatives on job creation and strategies that improves employment opportunities would help improve nutritional status and general household welfare in the study area. Per capita daily calorie intake is likely to increase more in household headed by female than in male-headed household. Empirical studies have shown that women tend to allocate resources towards goods that benefit the entire households, especially on nutrition inputs such as food (Haddad et al. 1996, Smith et al. 2006).

Calorie and Protein Consumption Levels and Potential Risks of Protein-Energy Malnutrition

The result of the comparison between calorie and protein consumption levels of household members by sex and age groups with the recommended daily allowance are presented in table 4. The average calorie intakes of the entire male and female members of the households are 2631. 18 kcal and 1941. 38 kcal per day respectively. While the average intake for male is higher than the associated recommended daily allowance (RDA), that of female falls below. The result is consistent with Orewa and Iyangbe (2009b) who also reported higher calorie intake (2428. 25 kcal) for males and lower intake 2094. 8 kcal for females in Nigeria. The result also supports Ayinde et al. (2010) that found a consistently higher calorie intake among male than female members of the household across the various age groups. The average daily protein intakes for the entire male and female members of the

households are 54. 31g and 54. 94g respectively. The daily intake values are higher than their average recommended daily intake. These values are higher than 43. 4g and 37. 7g estimated for both male and female members of household in Nigeria (Iyagbe and Orewa 2009). Using the overall averages for both genders without considering age differences would suppress pertinent information regarding the patterns of protein and calorie consumption patterns and the possible spread of malnutrition within the household. A closer examination of the protein and calories intake patterns by age and gender distribution among household members indicates that both males and females of all aged groups satisfy their daily protein intake level except for the adolescents who consumed slight below their minimum recommended levels. Adult male and female members consumed as much as 22. 70 percent and 20. 17 percent above their daily protein requirements respectively while male and female adolescents had shortfalls of 2. 04 percent and 6. 85 percent of their daily protein requirements respectively. The mean protein intake of the entire household is above the corresponding estimated RDA for both males and females. With respect to food calories, the result indicates that the calorie intake level of pre-school and school age children of both sexes as well as that of male adolescents and adult women fell below the minimum recommendations while the remaining members of household satisfied their daily calorie needs. While adult male members of the household consumed about 33. 24 percent in excess of daily minimum requirement, adult women, school age male children and male and female adolescents had short falls of 9. 05 percent, 13. 17 percent, 12. 29 percent and 17. 47 percent of their minimum daily requirements respectively.

Moderate shortfalls of 5. 29 percent and 5. 90 percent were found among male and female pre-school children respectively. The average calorie intake of the males is high than the recommended intake level while that of the female is lower. The foregoing indicates that the problem of protein and calorie consumption in the study area is more of inadequate calorie intake as opposed to protein intake. According to the United Nations Administrative Committee on Coordination Sub-Committee on Nutrition (ACC/SCN) (2000), protein intakes appear to be more adequate than calorie intake in most countries. This finding is also consistent with the findings of Bouis et al. (1998) and Food Nutrition Research Institute (FNRI) (1984). Furthermore, the problem of protein-energy deficiency is more pronounced among younger members of the household and among female than male members. Though there appears to be a slight shortfall in calorie intake of pre-school and school age children, their protein intake levels are above the minimum requirements. Children in those age groups though undernourished (in terms of calorie intake) but are unlikely to suffer from kwashiorkor and marasmus. However, adequate measure must be put in place to prevent future occurrence. While evidence of under-nutrition in terms of inadequate intake of protein and calorie are found among children and adult females members, excess consumption of both calorie and protein are established among adult male members of the households; suggesting that the possibility of over-nutrition among adult male members[3]. While over-nutrition could lead to certain health problems, it could however, be of benefit. Excess essential nutrients that are stored up in the body may be utilized to supplement temporary shortfalls in dietary intakes. As noted by Mittchell (1993), over-

nutrition, in a way, is good nutrition as it provides insurance against the need to necessitate essential body tissues to supply energy and other nutrients for its proper performance when current supply of food is inadequate to meet nutritional requirements. However, an excess of it over long period on time could result in conditions such as obesity.

CONCLUSION AND RECOMMENDATION

The study examined the problem of malnutrition among Nigerian households with emphasis on protein and calorie intake. Socioeconomic factors influencing per capita calorie and protein intakes as well as the possible risks of protein-energy malnutrition among household members were also examined. The study provided confirmatory evidence that protein energy malnutrition occurred among household members. The problem of protein energy malnutrition is more of inadequate calorie intake as opposed to protein intake. While on the average, both male and female members of the households satisfied their protein requirements, inadequate calorie intake was found among female members. A more disaggregated analysis by age and gender indicated a slight shortfall in protein intake among adolescents of both genders. Calorie intake insufficiencies were also evident among pre-school and school age children of both gender as well as male adolescents and female adults. Excess intake of calorie was more pronounced among male adults and excess consumption of protein was particularly obvious among adult males and females as well as male adolescents. While preschool and school age children of both genders satisfy their protein requirements, there appear to be shortfalls in their calorie intake. Children in these age categories are undernourished in terms of calorie intake

deficiency, however, they are not likely to suffer from kwashiorkor and marasmus. The patterns of intake of calorie and protein consumption among household members indicated the possibility of over-nutrition and under-nutrition coexisting among members of the households with over-nutrition and potential risks of obesity in adult males and under-nutrition among pre-school and school age children. Factors that would influence calorie and protein intake significantly include household monthly income, food budget share, education of household head, household size, dependency ratio and major occupation of household. Gender of household head would have significant influence on per capita calorie intake. Though increase in household monthly income would improve consumption of calorie and protein, household would transit from consumption of calorie dense diets (starch staples) to diets that have substantial amounts of protein as the marginal propensity to consume are higher for protein than calorie. Increase in household size will decrease consumption of protein more than calorie. Higher educational attainment by household head would likely result in significant reduction of calorie intake but would improve protein intake. Increase in the dependency ratio would reduce both calorie and protein intake but the reduction would be higher for protein than calorie. Nutritional deficiencies appear to be more of calorie intake than protein intake and female headed households are more likely to ensure equitable distribution of calorie to members than households headed by males. The implications are that improvement of household income, education of household head, food budget shares, reduction of household size, declined dependency ratio and equitable distribution of food within the households, among others, would

reduce protein-calorie intake deficiencies and potential risks of malnutrition. The study therefore recommends implementation of the new minimum wage for civil servants recently approved and signed into law by Nigerian government as well as policies that would enhance employment generation and income earning capacity of household members to enable them meet their nutrient requirements. Nutrition education programmes and campaigns should be organized in schools, through the media, community health and extension workers to raise awareness about the nutritional needs of members and the need for fair distribution of food among household members. The nutrition education programme should entail provision of nutritional profile of relatively cheap but nutritional rich food items to enable low-income households improve the nutritional status of members. In addition, well guided efforts to reduced family size could improve the per capita calorie and protein intake of members. This could be accomplished through direct actions in the form of birth control measures as well as other family planning strategies. These measures could help families exercise their preferences for birth (family size) control. This can take the form of awareness and periodic sensitization programmes organized by both government and nongovernmental organizations to furnish families with adequate family planning knowledge. The study also advocates gender specific interventions to empower women and improve their income generating capacities for the reduction of protein energy malnutrition.

AUTHORS BIOGRAPHY

Dare Akerele is an Assistant Lecturer at the Department of Agricultural Economics and Farm Management, Federal University of Agriculture,

Abeokuta, Nigeria. He is currently on a PhD programme at the Department of Food Economics and Marketing, University of Reading, UK. His main interest is on food and nutrition security, and development issues. He can be contacted at akereledare@yahoo. co. ukMohammed Kebiru IBRAHIM is an Assistant Lecturer at the Department of Agricultural Economics and Extension, Kogi State University, Anyigba, Nigeria. He is currently on a PhD programme at the Department of Food Economics and Marketing, University of Reading, UK. His research interest is in applied microeconometrics, household welfare, and development economics. He can be reached via mk. ibrahim@rocketmail. comSamuel A. Adewuyi is a Senior Lecturer at the Department of Agricultural Economics and Farm Management, University of Agriculture, Abeokuta, Nigeria. Research interests include applied microeconomic analysis, agricultural productivity and efficiency analyses. He has to his credit over 25 articles published in local and international journals. He can be contacted at samwuyi@yahoo. com