

Maternal nutrition in Nigeria

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ABSTRACT

Introduction: Nutrition refers to intake of food necessary for optimal growth, function, and health. A well-nourished mother is likely to have healthy infants with appropriate birth weight.

Objective: To review nutrition including the dietary habit of the pregnant and postpartum women in Nigeria.

Materials and Methods: Review involving Internet and literature search.

Results: Undernutrition in women aged 15–49 years decreased from 15% (2003) to 11% (2013), while overnutrition increased from 21% (2003) to 25% (2013). Inadequate intake of calories and micronutrient is a major feature of studies on the dietary pattern of Nigerian pregnant women. Multinutrient malnutrition and micronutrient deficiencies are a consequence of low content of macronutrients and micronutrients in diet and staple foods in Nigeria. Food restriction/taboo occur in association with primigravidity; teenage pregnancy; lack of formal education; low household income, signifying low socio-economic status and a low body mass index. Food restrictions/taboo are common with proteins and vegetable. Commonly consumed vegetable contain adequate mineral and vitamins. Poor food preparation habit e.g blanching of vegetable and parboiling of rice occur. Postpartum mother has poor dietary intake—malnutrition, overweight, and obese body mass index. Caloric intake is high with low intake of protein and fat. There is intake of spices and peppery food believed to flush out lochia, and consumption of palm wine believed to assist breast flow. Consequences of anemia include—folic acid and iron deficiency, malaria, hookworm infestation, and urinary tract infections.

Conclusion: Dietary habit on nutrition in pregnancy and postpartum women in Nigeria is poor.

Recommendation: Recommended measures to improve maternal nutrition in Nigeria include development of dietary guideline for pregnancy and postpartum; health education on nutrition in pregnancy, using information, education and communication materials; provision of adequate rest and reduction of workload; counselling of pregnant women on intake of diversified food, and provision of treatment supplement; encouraging exclusive breastfeeding; and micronutrient supplementation/food fortification for postpartum mothers.

Key words: Maternal; nutrition; Nigeria.

Introduction

Issues related to nutrition have continuously posed a tremendous challenge, especially in countries of developing world, where malnutrition spread over the lifecycle has contributed toward reducing quality of life and overall economic productivity, thereby stalling human development. Nutrition is defined as the intake of food necessary for optimal growth, function, and health, whereas good nutrition

refers to the intake of a well-balanced diet that provides all essential nutrients in optimal amounts and proportions. Poor nutrition on the contrary is a situation of intake of diet lacking nutrients either from overall insufficient food intake or from imbalance.^[1]

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| Access this article online | |
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| Website: www.tjogonline.com | Quick Response Code  |
| DOI: 10.4103/TJOG.TJOG_25_17 | |

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How to cite this article: Adinma JI, Umeononihu OS, Umeh MN. Maternal nutrition in Nigeria. Trop J Obstet Gynaecol 2017;34:XX-XX.

Malnutrition represents a situation of nutritional imbalance consisting of undernutrition—intake of food deficient in macronutrients (calories and protein) and sometimes micronutrients (multivitamins and minerals)—and overnutrition—intake of nutrient poor diet in spite of excess calorie. A given community may have undernutrition and overnutrition co-existing in response to changing lifestyles as may occur in urbanization, changing social economic circumstances, and add mixture of cultures. Reports have it that undernutrition is responsible for the death of approximately 1.5 million women and children annually worldwide, while overnutrition contributes immensely to the increasing global morbidity and mortality from diet-related noncommunicable diseases (NCDs).^[2] To prevent all forms of malnutrition, therefore, requires the intake of healthy diet with drastic reduction in the consumption of foods high in fat, sugar, and salt.^[2]

Pregnancy and breastfeeding predispose to undernutrition due to deficient intake of appropriate food requirement as a result of increased nutritional demand or losses. The children of malnourished women are not spared from the havoc of undernutrition. They are more likely to face cognitive impairments, short stature, lower resistance to infections, and a higher risk of disease and death throughout their lives.^[3] In general, fetal exposure to malnutrition is associated with congenital anomalies, intrauterine growth restriction, lower birth weight, stunting in childhood, shorter adult height, lower educational attainment, and reduced economic productivity.^[4] Stunted women often encounter greater risks during pregnancy such as obstructed labor,^[5] while low birth weight babies from malnutrition have been linked to an increased risk of obesity and NCDs in later life.^[6,7]

The preparation of food in any household is usually the responsibility of women. The implication of this is that their knowledge or lack of knowledge of nutrition will to a large extent affect the health and nutritional status of the entire family.

It is important, therefore, that malnutrition is addressed in women to ensure optimal health that will enable them fulfil the multiplicity of roles expected of them—income generation, having healthy children, care of the family, and ultimately advancing societal development.

The relevance of nutrition in women is vividly evident from the impact it has been perceived to play in at least five of the eight United Nations Millennium Development goals,^[8] viz:

Goal 1: Eradicate Poverty and Extreme Hunger: a well-nourished woman is more likely to have increased productivity and so

be able to provide for the family, and furthermore is more likely to have infant(s) with healthy birth weights with reduced likelihood of having malnutrition; Goal 2: Promote Gender Equality and Empower Women: adequate maternal nutrition is contingent on the woman's ability to make decisions and by increasing her capacity to improve her economic resources—all critical toward good nutrition that will optimize maternal and child health outcome; Goal 3: Reduce Child Mortality: well-nourished mothers are more likely to have normal birth weight babies with increased likelihood of surviving as infant and withstanding childhood illnesses; Goal 4: Improve Maternal Health: well-nourished mothers are more likely to withstand obstetrics morbidities such as pregnancy anemia and postpartum hemorrhage and are therefore less likely to die from pregnancy or its complications; Goal 5: Combat HIV/AIDS, Malaria, and Other Diseases: well-nourished mothers are more likely to develop enough immunity to combat HIV, malaria, and other infectious diseases during pregnancy or lactation. It is perhaps in the light of this perception that the International Federation of Gynecology and Obstetrics (FIGO) launched its recommendation on adolescent, preconception, and maternal nutrition at the 21st FIGO World Congress of Obstetrics and Gynecology held in Vancouver, Canada in October, 2015.^[9] Adolescent, prepregnancy, and maternal nutrition had furthermore been given a prominent future as the second target of the second goal of the United Nation Sustainable Development Goals 2015–2030.^[10]

This review on maternal nutrition in Nigeria highlights the nutritional status of Nigerian women with emphasis on pregnancy and postpartum period, discussing in each case the characteristics of nutrition and local solution put in place, as well as making recommendations on nutritional interventions appropriate to these periods.

Status of Nutrition in Nigeria

Nigeria is the most populous country in Africa, with a National Bureau of Statistics (NBS)^[11] population estimate of 193 million at December 30, 2016. The country harbors the highest population of black people in the world. Over the years, nutrition has not performed very well in Nigeria. The 2013 National Demographic Health Survey report indicates that undernutrition among women aged 15–49 years in Nigeria showed only minimal improvement over a 10-year period, with the 2003 value of 15% reducing to only 11% by 2013. Trends in overnutrition were even worse, increasing from 21% in 2003 to 25% in 2013 [Figure 1].^[12]

Undernutrition was found to be more prevalent among rural women (13%) compared to urban dwellers (10%), a pattern

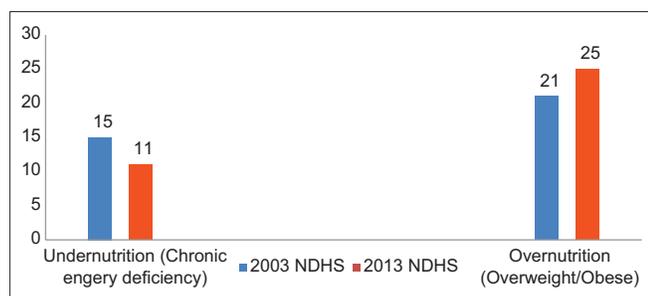


Figure 1: Distribution by undernutrition/overnutrition among Nigerian women—2003 versus 2013

which had been similarly reported from previous work in Nigeria,^[13,14] Ghana,^[15] and Burkina Faso.^[16]

Pregnancy nutrition

Poor maternal and child health indices in developing countries have been linked, among other factors to poor nutrition arising from dietary factors, including food restrictions, dietary indiscretion, quality of diet, poor feeding habit, and ignorance of nutrition.^[17] Pregnancy places a lot of physiologic, metabolic, and nutritional demands on the woman. Consequently, if optimal nutritional needs are not met, morbidity and even mortality can occur for both the mother and her fetus. The pregnant woman, therefore, needs to have a dietary intake sufficient to provide energy and nutrients for the mother as well as fetus.^[18] Inadequate calories and micronutrients intake seems to be a general feature from studies on dietary intakes during pregnancy from many developing countries, Nigeria inclusive.

The study conducted by Sholeye *et al.*^[19] on pregnant women from rural and urban communities in Ogun state, south western Nigeria indicated that the mean energy, vitamin A, folic acid, calcium, iron and sodium intake of both rural and urban respondents were below the recommended nutrient intake values. In contradistinction to their observation on mean intake of protein, vitamin C and zinc were found to be adequate among rural participants but were not up to the reference nutrient intake among urban participants. In general, the mean intake of almost all nutrients was significantly higher among rural respondents than their urban counterparts, but for vitamin A intake it was significantly higher among urban participants compared with the rural women. This observation is similar to the findings of the 2008 and 2013 Nigeria Demographic Health Survey, and is attributable to urban women having greater access to vitamin A-fortified foods, which are better regulated at urban areas.^[12,20] Multinutrient malnutrition and micronutrient deficiencies are a consequence of low content of macronutrients and micronutrients in diet and staple foods in sub-Saharan Africa and often result in high burden

of preventable infectious diseases, including hookworm infestations with severe untoward consequences among the vulnerable children and pregnant women.^[21,22] The food habit of pregnant women, particularly in South Asia and sub-Saharan Africa, has been documented to be poor, which, in the main, accounts for poor nutritional status of pregnant women in these regions.^[18,16,22,23] The report from Sholeye *et al.*^[19] in their study among pregnant women in Ogun state, south western Nigeria indicated that snacking occurred to varying degrees in 80.8 and 84.2%, respectively, among their rural and urban respondents. An observation was similarly made by Koryo-Dabrah *et al.*^[15] in Ghana. Snacks consumed include meat pie, sausage roll, biscuits, doughnut, and egg roll. Snacks are flour-based products that are often energy-dense, but of sub-optimal nutritive value.

Characteristics of Food Consumption by Pregnant Women in Nigeria

Food restrictions from food taboos have been reported in many communities in Nigeria and some other sub-Saharan African countries.^[18,16,22,23] The result is inadequacy of nutrient intake by pregnant women in such communities. Factors associated with adherence to food taboos include primigravidity; teenage pregnancy; lack of formal education; low household income, signifying low socioeconomic status and a low body mass index.^[24] Dietary restrictions are a common feature during pregnancy in many developing countries. A study carried out in Burkina Faso by Huybregts *et al.*^[16] showed that most of the respondents reported dietary restrictions. Dietary restriction was also reported in 48.8% of the respondents in a study carried out on pregnant women attending antenatal clinic at Korle-Bu Teaching Hospital and Osu Maternity Home in Accra, Ghana.^[15] Up to 15% of the participants in a study on nutrition and superstition carried out among pregnant women in Nwangele, LGA of Imo state reported adhering to traditional beliefs about nutrition and feeding practices, holding onto food taboos handed down from generation to generation.^[25] The food taboos documented by Sholeye *et al.*^[19] are mainly proteins and vegetables—beans, egg, fish, okra, and plantain, which are similar to those reported for rural areas of Nwangele, Imo state of Nigeria, Hounde district of Burkina Faso, and Korle-Bu, Ghana.^[15,16,25]

Studies from different parts of Nigeria showed that most pregnant women consumed leafy green vegetables albeit variety of species. Among the women of Akwa Ibom state in south Nigeria, Ikong Ubong (*Telfavia Occidentalis*) and Afang are widely consumed while *Amarathus* sp., okra, garden egg, and lettuce are consumed by Berom pregnant women of northern Nigeria.^[26] Studies have shown that the mineral and vitamin

contents of the commonly consumed vegetables in Nigeria are usually adequate for pregnancy. Some food preparation practices in Nigeria and similar countries are known to compromise the nutritive values of foods. Some notable factors include parboiling of rice and blanching of vegetable whereby they are immersed in boiling water for 10 min, the fluid decanted prior to boiling the vegetable.^[19,27] This is, however, different from the findings reported for the Berom women of northern Nigeria where 8% fried vegetable, 17% ate them raw, 5% boiled them, and 70% steamed the vegetable.^[26]

Women on normal healthy diet preconception do not need to change it in early pregnancy; however, it is important to pay attention to some nutrients that are needed in higher amount at various pregnancy stages. Some situations during pregnancy may increase the requirement for some nutrients, e.g., baseline undernutrition, young maternal age, multiple pregnancy, short interpartum period, malabsorptive disorders, or parasitic infestations.^[9] This situation may require additional specific nutrients supplementation such as folate, vitamin B12, iron (hemoglobin ferritin), and vitamin D. Pregnancy, in general, usually poses an increased demand for macronutrients such as protein, fats, carbohydrates, fiber as well as micronutrients such as vitamin A and D, iron, iodine, zinc, calcium, and selenium.^[9]

A major consequence of nutritional deficiency in pregnancy is anemia. It has been reported that anemia occurs in 35–75% of pregnancies in Nigeria.^[28-30] Anemia in pregnancy is usually dimorphic—mainly a combination of iron and folic acid deficiency. Iron deficiency occurs mainly because of the source of iron, which is of plant origin with low bioavailability due to the absorption inhibitory action of tannins and phytates. Folic acid is usually derived from leafy green vegetables and yam tubers, and deficiency can therefore occur on seasonal basis—during planting seasons when these foods are rarely available. Folic acid deficiency can also occur from inimical food preparation habit such as blanching or over-stewing of vegetable. Associated causes of anemia during pregnancy include malaria, urinary tract infections (UTIs), and hookworm infestations, which should be screened for and treated appropriately.

Local Solution

- Women attending antenatal care in Nigeria are as a matter of policy given nutritional supplement of iron and folic acid
- The pregnant women are also given malaria prophylaxis using sulfadoxine-pyrimethamine (Fansidar) drugs on monthly basis while being encouraged to sleep under long-lasting insecticide-treated bed-net

- UTIs when suspected are treated with appropriate antibiotics on the basis of midstream urine culture and sensitivity studies
- Hookworm infestations when suspected and identified from stool microscopy studies are also treated with appropriate antihelminthic drugs
- Nutrition education talks are also given as part of routine pregnancy health education.

Postpartum nutrition

Lactation places a high nutritional demand on the mother increasing her vulnerability to undernutrition. Inadequate maternal diet during this period will lead to poor secretion of nutrients in breast milk, which will invariably have long-term deleterious impact on the child's health.^[31] Report has it that the lactating woman produces approximately 700–800 ml of milk per day and this requires an extra energy need of about 500 calories per day.^[32] A study carried out in south western Nigeria, reported an overall poor dietary intakes among lactating women studied.^[33] In a similar study conducted among Igbo speaking women in south eastern Nigeria, malnutrition was also observed, the mean body mass index (BMI) of the women studied corresponded to overweight and obese category on the BMI scale, which was in fact regarded in this area as normal among lactating women expected to be “well fed” enough to undertake the task of nursing the new born.^[34] A similar picture has been reported for breastfeeding mothers from other studies.^[35,36] The study conducted by Ukegbu showed that cereals, root/tubers, legumes, and fruit/vegetables constituted the variety of foods consumed by the lactating women and that, furthermore, the diet was mainly starch-based and low in fruits and vegetables. Their mean energy intake was also found to be lower than recommended. The study showed a high intake of carbohydrates mainly from tubers, low intake of protein mainly from plant sources, and met only 15–20% of their fat requirement, mainly from palm and vegetable oil consumed on daily basis from soup/sauces. Plant-based foods have been noted to contain micronutrients with low bioavailability due to the presence of some nutrients, which may limit absorption of certain micronutrients. Therefore, continued dependence of the women mainly on starchy staples can place them at risk of micronutrient deficiencies (*hidden hunger*). The study also shows that the intake of some of the selected micronutrients such as calcium was low although iron and zinc derived mainly from plant sources, and vitamin A derived from red palm oil and vitamin A-fortified vegetable oil intake were within the recommended values.^[34] Other notable characteristics of food consumed by women during the postpartum period include the intake of peppery food preparation, hot spices, hot alcoholic beverages, root and

tubers believed to flush out lochia, and consumption of local palm-wine believed to promote breast-milk flow. A woman's good health and nutrition is critical to her ability to produce adequate breast milk and to care for her infant, and if her reserves are depleted, the effects can carry into subsequent pregnancies as well. When maternal nutrition is optimum, the infant requires little other than breast milk during the first 6 months of life. Exclusive breastfeeding is the safest feeding option for infants in developing countries with sub-optimal hygiene—preventing infection by the avoidance of contaminated water and also by the provision of protection from its immunoglobulin A antibodies and lactoferrin component.^[9]

Conclusion and Recommendation

The relevance of adequate nutrition in any society cannot be overemphasized in consideration of the vicious circle effect that undernutrition can engender from pregnancy to the newborn through to childhood, adolescence, and pregnancy in the next generation. Optimum nutritional status should be ensured before any woman embarks on a pregnancy and this should be maintained throughout the duration of pregnancy. It should, therefore, be ensured that pregnancy is embarked upon with the woman in the appropriate body weight (i.e., neither underweight nor overweight). Dietary issues such as food restrictions, dietary indiscretion, quality of diet, poor feeding habit, and ignorance of nutrition^[17] should be given a prominent position in the planning and implementation of nutritional intervention, especially in developing countries like Nigeria. Local solution presently in place on nutrition during pregnancy should be improved upon by the development of evidence-based nutritional guidelines appropriate for pregnancy and the postpartum period. Local health workers should counsel pregnant women on dietary diversification; intake of nutritional supplement; reduction of workload during pregnancy to conserve energy; and consumption of micronutrient-fortified food product.

Counselling should also emphasize on child spacing to ensure the replenishment of deficient nutrients through the provision of appropriate family planning measures.

More emphasis should be placed on the promotion and support of exclusive breastfeeding within the first 6 months postpartum.

It is also recommended that nutritional education counselling should be given to postpartum women, either at the time of discharge following delivery or during a one-week postpartum visit. All stakeholders to nutrition including government,

nongovernmental organizations, food industries, health workers, teachers, religious bodies, the general community, the family, and the individuals are expected to “think nutrition first”^[9] in order to collectively achieve the task of improving maternal nutrition.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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