

## Review Article

## Adolescent and pre-pregnancy nutrition in Nigeria

ADINMA JIB, UMEONONIHU OS, UMEH MN<sup>1</sup>Department of Obs/Gyn, University Teaching Hospital, <sup>1</sup>Nutrition Unit, Nnamdi Azikiwe, University Teaching Hospital, Nnewi, Nigeria

## ABSTRACT

Good nutrition during adolescent and pre-pregnancy period is critical towards a healthy pregnancy and normal birth weight infant. This article is a review of Adolescent and pre-pregnancy nutrition in Nigeria. Undernutrition in adolescent girls aged 15–19 years in Nigeria has been variously reported to range between 23% and 57.8%. Undernutrition was more prevalent among the rural compared to the urban adolescent, and was attributable more to socio-economic, and dietary factors. A high proportion of energy amongst adolescent, was derived from carbohydrates such as rice, yam, and cassava. Proteins were derived mainly from legumes and pulses, while fats were derived mainly from palm and vegetable oil. Iron was mainly of plant origin and had low bioavailability due to the presence of absorption inhibitors – tannins and phytates. A high levels of vitamin A was prevalent due to consumption of red palm oil. Undernourished adolescent girl and pre-pregnant women are likely to give birth to undernourished infants with the risk of transmitting undernutrition to the future generation. The recommendation towards the implementation of adolescent and pre-pregnancy nutrition in Nigeria include – The establishment of a country-wide school-based nutrition programme; Integration of Nutritional counselling with primary health care services, targeting out of school adolescents; Development of dietary guidelines and IEC materials on nutrition; and Establishment of Preconception clinic to counsel women on family planning and appropriate diet as well as monitor their body weight prior to pregnancy.

**Key words:** Adolescent; Nigeria; nutrition; pre-pregnancy.

## Introduction

Nutrition refers to the intake of food necessary for optimal growth, function, and health. Good nutrition is defined as a well-balanced diet that provides all the essential nutrients in optimal amounts and proportions, whereas poor nutrition refers to a diet lacking in nutrients either due to overall insufficient food intake or imbalance.<sup>[1]</sup> Malnutrition is a condition resulting from unbalanced diet and refers to inadequate intake of macronutrients such as calories and proteins (undernutrition), and in some cases, micronutrients, i.e., multivitamins and minerals. Nutrient-poor diet despite excess caloric intake – known as overnutrition – also constitutes malnutrition. Under and overnutrition can coexist in a given population in relation to changing lifestyles such as urbanization, socioeconomic progress,

and inter-culturalization. Undernutrition accounts for the death of approximately 1.5 million women and children annually, over-nutrition on the other hand, with the resultant increasing rate of overweight and obesity has become associated with increasing global morbidity and mortality burden from noncommunicable diseases. Malnutrition in all its forms can be prevented by ensuring access to healthy diet and reduced intake of foods high in fat, sugar, and salt.<sup>[2]</sup>

Nutrition is of particular important to women's health because of the linkage between poor nutrition and several socioeconomic factors associated with poor health and access to healthcare e.g., low educational attainment and

**Address for correspondence:** Prof. JI Brian D Adinma, Department of Obs/Gyn, NAUTH Nnewi, Anambra State, Nigeria. E-mail: [brianadinma@yahoo.com](mailto:brianadinma@yahoo.com)

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poverty, all of which are inextricably connected to poor reproductive outcome. Undernutrition usually occurs from inadequate intake of appropriate food requirement or from increased nutritional demand or losses that may occur during pregnancy and breastfeeding. Among the consequences of undernutrition include stunting (restricted growth) in early life, underweight, and wasting throughout the lifespan result in reduced resistance to infection, lassitude, and variety of disease conditions that can impair the ability of adolescents girls and women to adequately care for their families. Undernutrition can also result in shorter adult height and reduced economic productivity.

Both undernutrition and overnutrition have tremendous implications to the pre-pregnancy state, ultimately resulting in disease burden and deleterious consequences during motherhood such as predisposition to infections, anemia during pregnancy, malaria, hookworm infestations, urinary tract infections, diabetes mellitus, and pregnancy-induced hypertension. Obesity and overnutrition are key causes of hyperglycemia in pregnancy (HIP), in gestational diabetes (GD), and pre-pregnancy type 2 diabetes. HIP can be prevented by ensuring good quality balanced diet before pregnancy. FIGO recommends counselling on physical activity and practical nutrition education to inform choice on the correct quantity and quality of food to combat HIP. FIGO also recommends that women with gestational diabetes mellitus (GDM) be repeatedly advised to continue the same healthy eating habits after delivery to reduce the risk of future type 2 diabetes. The fetus is not spared from the ravages of malnutrition, often being predisposed to congenital anomalies, intrauterine growth restriction, and low birth weight.

The importance of nutrition in adolescent girls and women generally has been recognized globally, and has been captured directly or indirectly in five of the eight goals of the United Nation's Millennium Development Goals (MDGs) – Goals 1, 3, 4, 5, and 6.<sup>[3]</sup> The International Federation of Gynaecology and Obstetrics, furthermore, at its 21<sup>st</sup> World Congress of Obstetrics and Gynaecology held in Vancouver Canada in October 2015, launched a set of recommendations developed on adolescent, pre-pregnancy, and maternal nutrition by its nutrition expert group together with all other stakeholders. This document included among other things recommendations specific to nutrition in the adolescent girl.<sup>[4]</sup> The United Nation's Sustainable Development Goal 2015–2030, in addition, highlighted adolescent, pre-pregnancy, and maternal nutrition as the second target of the second goal of the SDG, thereby unequivocally buttressing the importance of nutrition

among this segment of our society, in contemporary global development.<sup>[5]</sup> This review introduces Nigerian perspective to nutrition in adolescent and pre-pregnant women. It further recommends measures towards the improvement and promotion of adolescent and pre-pregnancy nutrition in Nigeria, and by extension, other similar developing countries.

## Nigeria's Perspectives

Nigeria with a land mass of 923,768 square kilometres, and a 2015 population estimate of 182,201,962, is the most populous country in Africa.<sup>[6,7]</sup> Fourth-eight percent of the people are urban dwellers whereas the remaining 52% are rural.<sup>[7]</sup>

Nutrition remains a critical issue in Nigeria particularly in the more vulnerable groups – children and women. Nutrition trends between 2003 and 2013 from the Nigerian National Demographic and Health Survey (NDHS) data had shown only but minimal improvement. Undernutrition in women aged 15–49 years which was 15% in 2003 decreased to just 11% 10 years later, whereas overnutrition (overweight/obese) which was 21% in the 2003 survey increased to 25% by the 2013 survey!<sup>[6,8]</sup>

The 2013 NDHS also reviewed that 23% of the adolescent girls (15–19 years) were undernourished and that undernutrition was more prevalent among the rural women (13%) compare to urban (10%) dwellers. This dichotomy in the nutritional status between rural and urban women was also reported by Sebanjor *et al.*, who observed in a study conducted in Lagos state of Nigeria that undernutrition occurred in 10% of rural women compared to only 2% in the urban dwellers,<sup>[9]</sup> an observation which was also reported in studies from Koryo-Dabrah *et al.* from Burkina Faso<sup>[10]</sup> and Huybregts *et al.*<sup>[11]</sup> from Ghana.

## Pattern of Adolescent Nutrition

The health and well-being of today's adolescent are crucial because they are tomorrow's adult population. Until very recently, little attention was paid to the nutrition of adolescents despite the fact that nutrition influences growth and development throughout infancy, childhood, and to an even greater extent, adolescence.<sup>[11]</sup> The fact that many adolescents are in school provides an ample opportunity to reach out to a relatively large segment of the nation's population and even beyond to their teachers, parents, and even to the community, all of whom are stakeholders on nutrition.<sup>[12]</sup> Adolescence is generally believed to represent a window of opportunity to prepare for a nutritionally healthy

adult population.<sup>[13]</sup> It is important that the nutritional needs, especially of the adolescent girls be met, otherwise there would be an increased likelihood of their giving birth to undernourished children, thereby transmitting undernutrition to future generations.<sup>[14]</sup> Mild to moderate malnutrition commonly occurs in children in developing countries. These children usually survive into adolescence with chronic mild malnutrition detectable only through anthropometric measurement.

A study conducted among secondary school children in Ibadan, Nigeria reported undernutrition in 23.4% in the girls compared to 41.4% in boys.<sup>[15]</sup> The observed incidence of undernutrition for adolescent girls in this study was similar to the 23% undernutrition rate reported for adolescent girls in the 2013 Nigerian NDHS survey,<sup>[6]</sup> but is much lower than the 57.8% reported by Ukegbu and Onimawo<sup>[16]</sup> for adolescent girls in south-eastern Nigeria.

The suboptimal growth that may occur in teenage adolescents is attributable to adverse environmental conditions, low socioeconomic status, and poor diet.<sup>[17]</sup>

A major factor related to undernutrition in adolescent is early marriage. Poverty is one of the underlying factor for the perpetuation of early marriage. Up to two-third of women in sub-Saharan Africa and many other Asian countries have their first child before the age of 20 years.<sup>[18]</sup> Early marriage is common in Nigeria. It is more common in the north than the south of the country; in rural than the urban part of the country; in women with poorer educational attainment; and in Muslim than in Christian girls. The 2013 NDHS survey showed that as high as 78% of girls aged between 15 and 19 years were married in the northern Muslim state of Jigawa.<sup>[6]</sup> Report from a Nigeria Health Survey showed that 40% women with undernutrition were less than 15 years at the time of their marriage.<sup>[18]</sup> In general, marriages below 15 years tended to be associated with poverty and illiteracy, a feature also reported in other parts of the world such as Nepal.<sup>[19]</sup> Even in the USA, adolescents who bear children are likely to have been reared in poverty.<sup>[20]</sup>

A high proportion of energy derived from carbohydrate is known to characterize food consumed by adolescents in Nigeria which are mainly starchy foods such as rice, yam, cassava flour, bread, Abacha (tapioca), and plantain. Daily Recommended Intake (DRI) 2002 recommended that 55–60% of total calories should come from carbohydrates, 10–20% from protein, and less than 30% from fat.<sup>[16]</sup> The study conducted among adolescents in south-eastern

Nigeria showed that carbohydrate intake was greater than 80%, which was much higher than that recommended for adolescents. Protein intake was 9% whereas fat was 8%, which are both lower than the recommended daily intake.<sup>[16]</sup> Proteins were derived mainly from legumes such as beans and its products e.g., akara, moi moi, and okpa. Important sources of fat are vegetable oil and palm oil used for making soup and stew. The diet of adolescents in Nigeria rarely include high dense food such as margarine or butter, meat, and milk.

## Characterization of Pre-pregnancy Nutrition

The pre-pregnancy nutritional status of a woman is a determinant of the birthweight and ultimate survival of her infant. This is particularly true in relation to women who have experienced protein-energy malnutrition as well as micronutrient malnutrition at one time or another during their life.<sup>[21]</sup> It has been estimated that normal infants in industrial countries have a mortality rate of 2/1000. Low birth-weight babies on the other hand have a mortality rate of 86/1000. When low birth-weight babies survive following delivery, they have poor vision, decreased educational attainment, and more chances of developing cerebral palsy, deafness, and autism.<sup>[22]</sup> A US study observed that women with a pre-pregnancy weight below 59 kg were more than twice as likely to have low birthweight infants when compared to women with pregnancy weights greater than 59 kg.<sup>[23]</sup>

It is important therefore that women attain adequate nutritional status before embarking on pregnancy. Increased dietary intake in macro and micronutrients before conception through information, education, and communication campaigns (IEC) is essential in improving the nutritional status of girls and the health and survival of their children before they become pregnant. Family planning programs are also important to the improvement of maternal nutritional status before their first pregnancy as well as subsequent pregnancies. For women who have had one or more children, adequate birth spacing is recommended to enable them to replenish their nutritional stores. Birth spacing can be achieved through family planning and exclusive breast feeding.

Pre-pregnancy maternal weight should be measured since it constitutes a good predictor of infant birth weight. Women with low birth weight are encouraged through nutritional education such as dietary and appropriate nutritional supplementation, and interventions to increase energy, and reduce energy expenditure to prepare themselves to achieve optimal nutritional status prior to pregnancy.

There are no specific local solutions targeted at adolescent and pre-pregnancy nutrition in Nigeria. FIGO has recommended adoption of good dietary and lifestyle habit before pregnancy to optimize the nutritional status of adolescents girls and women. Addressing specific nutritional needs and establishing good dietary habit during this period will drastically minimize dietary modification during pregnancy. FIGO further recommends the incorporation of nutritional assessment and pregnancy planning in to routine health care for adolescents and women of reproductive age. Health education of young girls and adolescent on healthy diet and adequate physical activity and their importance to women's health especially during reproductive age should be given priority. This should ideally be commenced during the primary school year and continued through secondary and even tertiary educational period. This nutritional education program should also involve capacity building of healthcare providers, together with education for teachers, parents, and social and cultural organizations, to promote a whole community approach toward improving nutrition. FIGO recognizes that underweight as well as overweight/obesity are important risk factors for adverse pregnancy and neonatal outcome, and recommends that appropriate dietary modifications and micronutrients supplementation, where necessary, be made to bring woman in an optimal nutritional state and body weight prior to embarking on a pregnancy.<sup>[4]</sup> Recommendations considered to be appropriate towards the improvement of adolescent and pre-pregnancy nutrition in Nigeria include.

Primary prevention strategies that target school-based nutrition programmes in primary schools and the use of IEC materials for adolescents in secondary and tertiary schools; Integration of nutrition counselling into primary health care services to target out-of-school adolescent and pre-pregnant mothers and the development of dietary guidelines and IEC materials for adolescents and pre-pregnant women for improve their intake of micro and macronutrients. Another important recommendation is the establishment of preconception clinics as a matter of policy in all categories of maternal health facilities to counsel adolescent and pre-pregnant women on appropriate nutrition, counsel and offer family services to women desiring child spacing, and ensuring that pre-pregnant women achieve the desired optimal weight prior to conception.

When adolescent girls and pre-pregnant women attain appropriate and optimum nutritional status prior to conception, they are better in position to go through a healthy pregnancy with good maternal and neonatal outcomes.

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## Conflicts of interest

There are no conflicts of interest.

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