

Prevalence, Determinants and Pregnancy Outcomes of Under-Nutrition among Women Accessing Antenatal Care or Attending Antenatal Clinic Public Hospitals in Ibadan, Nigeria

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Abstract

Background: Nutrition plays a major role in the health of a pregnant woman and that of the foetus in-utero. The nutritional status of a woman before and during pregnancy is an important factor in deciding the outcome of that pregnancy. Worldwide, almost two billion people are said to be affected by various form of malnutrition or the other which accounts for about 11% of the global burden of the disease. Maternal under nutrition has been implicated as one of the major risk factor for poor pregnancy outcomes such as obstructed labour, preterm birth or low-birth-weight (LBW) babies and bleeding after delivery. Malnutrition amongst women of reproductive age has been recognized as life threatening public health issues in the world with emphasis on many sub-Saharan African and Asia Countries. Maternal under-nutrition is also of great concern in a country like Nigeria as 12% of women of reproductive age are undernourished with body mass index, or BMI (< 18.5) (NNHS, 2018). This condition result from so many multiple factors such as poor nutritional practices, lack of quality health care facilities and access to services, lack of portable drinking water, poor environmental sanitation, armed conflict particularly in the north leading to displacement of farmers from their farm land, climate change, high unemployment and extreme poverty. It is therefore very crucial to carry out this study on under nutrition and its implications on the pregnant women and their babies.

Aim of the study: To assesses the prevalence, determinants and pregnancy outcomes of under-nutrition among women attending ANC in public hospitals in Ibadan, Nigeria.

Methodology: A purposive sampling technique will be used to select five health care facilities (1 tertiary, 1 secondary and 3 primary health care) based on client inflow for antenatal care services (ANC) and a proportional allocation of samples will be done across these facilities. A total of 1159 pregnant women will be administered the structured questionnaire and 736 (348 exposed and 348 non-exposed) will be recruited for the prospective cohort study. These populations will be grouped into exposed and unexposed using their nutritional status. They will then be followed up till delivery to determine the effects of under-nutrition on the pregnancy outcome which includes both the maternal anemia, mode of delivery and weight gain and neonatal outcomes (Low birth weight, still birth, preterm delivery neonatal death. Data will be entered in excel spread sheet for data cleaning and data will be transferred to SPSS version 251 for analysis.

Keywords: Nutrition; Pregnancy; Mortality; Diarrhea.

Introduction

Background of the study

Nutrition plays a major role in the health of a pregnant woman and that of the fetus in utero. The nutritional status of a woman before and during pregnancy is an important factor in deciding the outcome of that pregnancy. Deficiency or imbalance in the supply of nutrient is referred to as Malnutrition. In broad terms, malnutrition includes both under nutrition and over nutrition [1]. For the sake of this study our focus shall be on under nutrition in pregnancy. As such, the term under nutrition and malnutrition shall be used interchangeably in this write up.

The World Health Organization (WHO) defines under-nutrition as the cellular imbalance between supply of nutrients and the body's demand for them to ensure growth, maintenance and specific functions [2-4]. In terms of body mass index, Maternal under nutrition is a state of chronic nutritional deficiencies in women of reproductive age (15-49years) resulting in a body mass index (BMI) of <18.5kg/m². Under-nutrition in pregnancy is therefore defined as a state of nutritional imbalance or deficiencies whereby the nutrient stores (Macronutrient or micronutrient)

are less than the required quantity that is needed to achieve optimal pregnancy outcomes thus resulting in a body mass index of less than 18.5kg/m² or a mid-upper arm circumference (MUAC) of less than 23cm.

Pregnancy is an anabolic process and the demand for nutrient of pregnant women exceeds that of a non-pregnant healthy woman due to the growing fetus which depends solely on the mother for its growth. The nutritional status of a woman before and during pregnancy will dictate her ability to withstand the physiological, psychological and physical changes associated with pregnancy [5]. As such, some pregnant women will re-

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quire additional supply of nutrient for better outcome of such pregnancy and in a case of nutritional deficiencies; both the pregnant woman and foetus are adversely affected.

Maternal under-nutrition is known to contribute largely to the incidence of poor foetal growth, low birth weight (LBW) and infant morbidity and mortality and can cause long-term, irreversible and detrimental cognitive, motor and health impairments [6]. A child with severe acute malnutrition is nine times more likely than a well-nourished child to die from common infections such as malaria, pneumonia or diarrhea.

Problem statement

Worldwide, almost two billion people are said to be affected by various form of malnutrition or the other which accounts for about 11% of the global burden of the disease [7]. Maternal malnutrition (MM) has been implicated as one of the major risk factor for poor pregnancy outcomes such as obstructed labour, preterm birth or low-birth-weight (LBW) babies and as well as bleeding after delivery. Malnutrition amongst women of reproductive age has been recognized as life threatening public health issues in the world with emphasis on many sub Saharan African and Asia Countries [8].

According to UNICEF, more than half a million women die from causes related to pregnancy and childbirth yearly. Maternal mortality rate for a woman in the developing countries is 300 times greater than for women living in the developed countries [9]. Ninety-five percent (95%) of the world’s maternal mortality are from Africa and Asia with precisely 50% of the global total coming from Sub-Saharan Africa and 35% from South Asia.

Methodology

Description of study area

Ibadan is the capital of Oyo State and most populous city of Nigeria. With a population of 3,552,000 out of over 6 million of the whole of Oyo state. It is the third most populous city in Nigeria after Lagos and Kano it is the country’s largest city by geographical area [10]. In Africa, it is the second most populous in Africa behind Cairo. Ibadan is located in south-western Nigeria on a coordinate of latitude 7.37756 and longitude 3.90591. The city is 128 kilometres (80 mi) inland northeast of Lagos and 530 kilometres (330 mi) southwest of Abuja, the federal capital, and is a prominent transit point between the coastal region and the areas in the hinterland of the country. The city covers a total area of 3,080 square kilometres (1,190 sq mi), the largest in Nigeria after Bauchi.

Research design

For objective, cross sectional study design will be used to assess the nu-

tritional status of the pregnant women attending ANC in the selected hospital in Ibadan [11]. For objective a cohort study design will be employed among pregnant women attending ANC in the selected hospital in Ibadan whose pregnancy is between in the second trimesters (14-26 weeks).

Source of population

Study population for objectives: The study population will include all pregnant women using any of the selected hospitals for their ANC services and whose pregnancy is within the second trimester (14-26weeks).

Study population for objectives: This shall include all pregnant women using any of the selected hospitals for their ANC services, resides in Ibadan and are willing to be part of this study [12].

Inclusion criteria

- All singleton pregnant women before 14-26weeks gestation using any of the selected healthcare facilities for their ANC.
- Who has no medical risk pregnancy either in their first or second trimester before the commencement of this study
- Permanent residence of Ibadan or who is not likely going to relocate in minimum of 6 month after the commencement of this study.

Exclusion criteria

Any medical diseases which can affect the nutritional status like HIV Aids, Diabetes Mellitus, and Chronic Hypertension.

Sampling method

A purposive sampling method will be used to select 5 secondary health care facilities across the city. A proportional allocation of the sample size will do to each facility based on the population of client attending ANC in each of them [13].

Results

Data analysis

After data collection, data will be entered using the Excel spread sheet which will be used to clean and treat all missing and outliers. Data will then be exported to SPSS version 21 for analysis. Descriptive statistics like frequencies and summary statistics Mean Standard deviation and percentage will be used to describe the study population in relation to socio demographic and other important variables [14]. For continuous variables, normality test will be done using visual inspection and statistical tests (Table1).

Outcome variables	Types of adverse outcomes	% of outcome among the Undernourished Pregnant women (Exposed)	% of outcome among the Nourished Pregnant women (Un-exposed)	Exposed to Non exposed ratio	Power	Sample size	Sample size	Total sample size
						For exposed	For unexposed	
Low Birth Weight	Neonatal outcome	18.4	9.8	1:01	80%	305	305	610
Still Birth	Neonatal Outcome	9.84	1.09	1:01	80%	127	127	254

Pre term	Neonatal delivery	35	15.22	1:01	80%	120	120	240
APGAR score <7 at 5 min	Neonatal Outcome	47.54	10.87	1:01	80%	29	29	58
Caesarean Section	Maternal outcome	38.7	27.7	1:01	80%	334	334	68

Table1: The proportion of maternal and neonatal outcomes among pregnant women attending ANC in a health care facilities was taken from previously conducted studies.

Categorical data will be compared using the Chi square test, and an independent test will be used for comparison of the mean differences of continuous variables between the exposed and the non-exposed pregnant women. Bivariate and multivariate logistic regression will be done performed to evaluate the statistical association of maternal and neonatal outcomes of the malnourished and non-malnourished pregnant women with the independent variables [15]. The degrees of association between the dependent and independent variables will be assessed using the Adjusted Odds Ratio (AOR) with 95% confidence interval, while the level of Statistical significant will be set at $P > 0.05$.

Discussion

A structured interview questionnaire will be used to access the prevalence and determinant of maternal under-nutrition among the population.

Section A: of the questionnaire will consist of baseline questions concerning socio-demographic characteristics of the participant and their economic status.

Section B : Individual minimum dietary diversity for women (MDDW) will be assessed using the Fanta dietary tool as stated in the NDHS nutritional guidelines constructed based on data from a 24hours qualitative dietary recall interview and according to the standard guide-line (Food and Agriculture Organization [FAO and FHI 360, 2016).

Section C: This section captures the household food security status (HFAIS) characteristics of the respondent.

Section D: This section will capture the health and health seeking behaviour characteristics of the respondents. Health seeking behaviours such as use of insecticide treated nets (ITNs), uses of preventive dose of antimalarial and supplement use will also be asked in this section [16-20].

Section E: This will also capture the clinical aspect such as the vital parameters, laboratory analysis of blood samples will be done to assess the Haemoglobin Conc to check concentration in checking for anaemia among the pregnant women. Women with haemoglobin level $< 11 \text{ g dl}^{-1}$ shall be labelled as anaemic. A follow up and parameter assessment shall be done minimum of 4 times at each of their standard ANC visit as recommend by WHO in the focused antenatal visits guidelines.

Section F: This part will keep track of the Maternal outcome such as Mode of delivery, anaemic condition and weight gain will be assessed for the two groups and the neonatal outcomes such as preterm, still birth and Low birth weight, will be assessed within 24hrs of delivery using the digital baby scales.

Conclusion

A total of 1159 pregnant women that are eligible will be administered the structured questionnaire and 736 participants will be recruited into the prospective cohort studies. This population will group into exposed and unexposed through their nutritional status. The women will be categorized

into two groups. Any women with Mid Upper Arm Circumference of $> 23 \text{ cm}$ will be grouped categorized as undernourished and $< 23 \text{ cm}$ as nourished. These two groups will then be followed up till delivery to see the effects of under nutrition on pregnancy outcomes.

Ethical Consideration

Ethical approval and clearance to conduct this study was obtained from the Ethical Institutional Review Board committee [IRB] of the University Ibadan Institutional Review Committee (IRC). The Respondents' consent will be obtained after provision of adequate, clear and complete information about what the study entails.

Confidentiality of Data

Confidentiality of all information was ensured. Research assistants working on the project was given strict instruction as regards ensuring confidentiality. Serial numbers and not names were used on questionnaires in order to ensure participants privacy. Only the researcher knows the identification numbers and the information were kept secured.

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