

EFFECT OF SOME MATERNAL DIETARY PRACTICES ON NEONATAL BIRTH WEIGHT IN RURAL AND URBAN AREAS OF EBONYI STATE, NIGERIA

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ABSTRACT

Background: Maternal dietary practices and the resultant nutritional status is a major determinant of the pace and balance of foetal growth, with effects that have adverse consequence later in infancy and adulthood.

Objectives: The study assessed the effect of some maternal dietary practices on neonatal birth weight in Ebonyi State, Nigeria.

Material and Methods: The study involved 395 singleton babies delivered in five (5) randomly selected hospitals in the State. Anthropometric measurements of the neonates were taken at birth using standard methods. Data on maternal dietary practices (meal skipping, snacking habit, craving habit and food forbidding habit and other socio-economic and socio-cultural information were obtained using Focus Group Discussions (FGDs) and validated pre-tested questionnaire. The data obtained were analysed using appropriate statistics.

Result: The prevalence of low birth weight (LBW= $<2.5\text{kg}$) was 4.8%. There was a significant difference ($P=0.03$) in the prevalence of LBW between urban (8.5%) and rural (3.2%) neonates. There were no significant ($P>0.05$) difference in the meal skipping habits, snacking pattern and food craving of rural and urban mothers; however, there were significant differences in the reasons for these habits. Significantly ($P<0.001$) more rural (43.9%) compared to urban mothers (8.5%) forbid some foods. The 24-hour recall of foods consumed showed that 60% had eaten food from the starchy food group, 25% from the meat/legume group, 50% vegetables and 53% fruit group. These practices had no effect on birth weight except for cultural adherence to forbidden foods. More LBW neonates (11%) were found among mothers who forbid some food than those who did not (3.8%), indicating that cultural practices have detrimental effects on birth outcome.

Conclusion: This calls for intensive nutrition education by professional Nutritionists/Dietitians.

Keywords: Meal skipping, craving, snacking, culturally forbidden foods, low birth weight

INTRODUCTION

Maternal dietary practices and the resultant nutritional status is a major determinant of the pace and balance of foetal growth, with effects that have adverse consequences later in infancy and adulthood. Maternal dietary imbalance at critical periods of development in utero can trigger an adaptive redistribution of foetal resources, including growth retardation. Such adaptations affect foetal structure and metabolism in ways that predispose the individual to later cardiovascular and endocrine diseases.

Poor nutrition knowledge leads to superstition and misconception about food requirements and nutritive value of food, a very common condition in developing countries of the world (1). Due to their level of poverty, poor educational background and

nature of their work, (1) it was observed that Ebonyi women fed more or less on foods like dried bread, roasted or boiled yam with little or no oil occasionally and foo-foo with watery type soup devoid of vegetable in the midst of work. In other words, their feeding is predominantly starchy foods. This is also a major determinant of nutritional status and pregnancy outcome.

Of the pregnancy outcomes that might be affected by maternal nutrition, the one encountered most often in research literature is low birth weight. Other outcomes are deformities, morbidity and mortality rate (2). Birth weight is the body weight of a baby at its birth. Average birth weight is often 3.5kg, with a range of between 2.5kg – 5kg (3)

Low birth weight is defined as a body weight at birth of less than 2500g. There are two main causes of low birth weight: prematurity and intrauterine growth retardation (IUGR). Infants born with low birth weight suffer from extremely high rates of morbidity and mortality from infectious disease, and are underweight, stunted and wasted beginning in the neonatal period through childhood (4). Based on hospital records, collected from 1997-2000, a prevalence of low birth weight of 50% was found among mothers of reproductive age. No wonder the government of Ebonyi State mounted various mother and child health programme in order to solve some of the problems enumerated. This study is therefore an attempt to ascertain the effect of some maternal dietary practices (meal skipping, snacking habit; craving habit, and food forbidding habit) on neonatal birth weight in rural and urban areas of Ebonyi State, Nigeria.

METHODOLOGY

Area of the study

The study was carried out in Ebonyi State Nigeria.

Design of the study

A cross sectional study design was employed.

Population of the study

The study involved 395 singleton babies delivered in five (5) randomly selected hospitals in the state.

Informed consent

Ethical approval was obtained from Ebonyi State University Teaching Hospital, Abakaliki Ethical committee, as well as the Head of Department of obstetrics and Gynaecology, Ebonyi State University Teaching Hospital, Abakaliki.

Sampling Technique

The State was divided into three senatorial zones. Simple random sampling was used to draw one urban, (Onueke, Afikpo, Abakaliki) and one rural (Mgbo, Nsokara, Amasiri) community from each of the three senatorial zones. The women for the study were selected by drawing a sample frame of all mothers attending Clinics in each of the hospitals and maternity Clinics that were used for the study.

Method of Data Collection

A focus group guide was constructed to guide in the focus group discussion. It was used to elicit information on Nutrition Knowledge, food consumption pattern, perception of healthy eating and the nutritional factor that affect pregnancy outcome, food habit and family history of the respondents. The focus group participants were drawn from the

hospitals. The participants include pregnant mothers within the age of range of 18-45 years. Each of the focus group constituted 8-12 women and each discussion session lasted between 45-60 minutes.

The instrument for data collection for the cross-sectional survey was the questionnaire. It was used to collect data on socio-economic characteristics, dietary practices and food consumption pattern of the respondents, as well as their nutrition knowledge. The questionnaire was self-administered with the help of trained research assistants.

Neonates were weighed within 24 hours of birth, using a salter spring balance; crown-heel length was measured to the nearest 0.1cm using a portable pedobaby baby metre. Occipitofrontal head circumference was measured to the nearest 0.1cm, on the left side of the body, using a non-stretch tape. Abdominal circumference was measured at the level of umbilical expiration. Placental weight was recorded to the nearest 5g using 1shida scales after trimming of the umbilical cord and membrane (5).

Method of Data Analysis

Information from the questionnaire were coded and entered into the computer. Data were analysed using statistical package for social science (SPSS) for Windows version 15.0 students t-test was used to compare group means. Simple correlation and multiple correlation and regression analysis were used to test for relationship and independent associations respectively, between birth weight and maternal dietary practices.

RESULTS

Table 1 reveals that 32.7% and 40.2% of rural and urban respondents respectively skipped their meals. There was no significant ($P > 0.05$; $df = 2$; $X^2 = 20$) difference between rural and urban respondents of those who skipped their meals, 50.5% and 44.7% of rural and urban respondents respectively skipped breakfast; 49.5% (rural) and 48.9% (urban) skipped lunch. No rural respondent skipped super, whereas 6.4% of urban respondents skipped super. A significantly ($P < 0.01$) higher number/ percentage 77 (84.6%) of rural respondents who skipped meals did so because they were not hungry compared to 18 (38.3%) of their urban counterparts. Also 34% of urban respondents skipped meals as a means of controlling weight while 17% skipped meals because food was not enough. More rural respondents 12 (13.2%) skipped meals as a result of being too busy compared to 4.3% of their urban counterparts.

Table 1: Meal Skipping Habits of Respondents

	Rural	Urban	Total
(a) Skipping of meals			
Skip meals	91(32.7)	47(40.2)	138(34.9)
Do not skip meals	187(67.3)	70(59.8)	257(65.1)
Total	278(100)	117(106)	395(100)
		X²=2.00; df=1; P=0.16	
(b) Meals skipped			
Breakfast	46(50.5)	21(44.7)	67(48.6)
Lunch	45(49.5)	23(48.9)	68(49.3)
Supper	-	3(6.4)	3(2.2)
Total	91(100)	47(100)	138(100)
		X²=6.03; df=2; P=0.05	
(c) Reasons for skipping meal			
Am not hungry	77(84.6)	18(38.3)	95(68.8)
Am controlling my weight	-	16(34.0)	16(11.6)
Am very busy	12(13.2)	2(4.3)	14(10.1)
Food was not enough	2(2.2)	8(17.0)	10(7.2)
Am out for work	-	3(6.4)	3(2.2)
Total	91(100)	47(100)	138(100)
		X²=58.28; df= 4; P=0.00	

Table 2, shows that there was no significant ($P>0.05$) relationship in the snacking habit of rural and urban respondents. Majority (98.5%) of the respondents ate snacks. Their reasons for eating snacks differed significantly ($P<0.001$) $df = 4$; $X^2 = 36.98$). More rural respondents (30.9%) ate snacks to suppress hunger while 4.4% of urban respondents ate snacks for the same reason. Also 57% of urban respondents ate snacks just for the love of it compared to (32.7%) of rural respondents. Others reasons for eating snacks

include; to replace meals (13.8%), make up meals (6.2%) and their availability (17.2%). Types of snacks consumed varied from legume (moin-moin, akara, Okpa and groundnut), cereal (biscuit, cakes, chin-chin) and starchy root/tuber (abacha, pudding and potato) based snacks to carbonated beverages and fruits. About eighty percent (79.9%) of the respondents ate fried fish/meats.

Table 2: Snacking pattern of respondents

	Rural	Urban	Total
(a) Snacking habit			
Take snacks	275(98.9)	114(97.4)	389(98.5)
Do not take snacks	3(1.1)	3(2.6)	6(1.5)
Total	278(100)	117(100)	395(100)
		X²=1.21;df =1; P=0.27	
(b) Reasons for eating snacks			
To replace meals	36(13.1)	17(14.9)	53(13.6)
To make up meals	18(6.5)	6(5.3)	24(6.2)
They are available	46(16.7)	21(18.4)	67(17.2)
To suppress hunger	85(30.9)	5(4.4)	90(23.1)
I just love eating them	90(32.7)	65(57.0)	155(39.8)
Total	275(100)	114(100)	389(100)
		X²=36.98;df=4;P=0.00	
(c) Types of snacks			
*Abacha	237(86.2)	96(84.2)	333(85.6)
Groundnut	264(96.0)	98(86.0)	362(93.1)
*Moin-moin	255(92.7)	88(77.2)	343(88.2)
Biscuit	241(87.6)	77(67.5)	318(81.7)
Cake	174(63.3)	59(51.8)	233(59.9)
*Okpa	275(100)	98(86.0)	373(95.9)
*Akara	260(94.5)	80(70.2)	340(87.4)
Carbonated soft drinks	230(83.6)	111(97.4)	341(87.7)
Fruits	250(90.9)	93(81.6)	343(88.2)
Fried bread fruit (<i>Treculia africana</i>)	153(55.6)	49(43.0)	202(51.9)
Bread and Butter	238(86.5)	102(89.5)	340(87.4)
Fried yam	214(77.8)	83(72.5)	297(76.3)
Fried potatoes	236(85.8)	78(68.4)	314(80.7)
Fried fish/meat	222(80.7)	88(77.2)	310(79.7)
*Chin-chin	232(90.3)	75(65.8)	307(49.4)

*Abacha-African Tapioca (cassava stripes); *Moin-moin – steamed bean pudding; *Okpa – steamed bambara nut pudding; *Akara – fried bean cake; *Chin-chin – fried African pastry.

Tables 3: shows that pregnant women in the rural and urban areas craved for a variety of items. About 65% of the respondents craved for clay (uro), 29.1% mentioned colanut and 11.2% ice. More rural than urban respondents mentioned craving for rock (22.1% versus 11.5%), sand (38.7% versus 28.1%), chalk (54.5% versus 26%) and snuff (19.1% versus 3.1%)

Actual craving habit (table 3b) by the respondents showed that 52.7% of the respondent did crave for some items, while 47.3% did not. There was no significant ($P>0.05$) difference in the craving habit of rural and urban respondents. In terms of items craved for, rural respondents craved more for cola nut (40.4%), sand (33.3%), clay (19.5%) and chalk (17%). The urban respondents craved more for clay (57.4%), ice (26.6%), cola nut (13%), sand (13%) and chalk (13%).

Chi-square analysis showed that there was a significant ($P<0.001$) difference in the reasons given for the craving habits. More rural respondents (38.3%) than urban respondents (19.3%) just love eating these items; while more urban respondents (54.4%) than rural respondents (28.6%) ate these items for emotional stability. It was also observed that more urban respondents (26.3%) compared to 15.6% of their rural counterpart ate theirs for no reason. Only 17.5% of rural respondents ate theirs to stimulate appetite.

Table 3: craving by respondents and reasons for craving

	Rural	Urban	Total
(a) Items pregnant women crave for			
Clay (Uro)	150(63.8)	65(67.7)	215(65.0)
Cola nut	68(29.6)	27(28.1)	95(29.1)
Rock	52(22.1)	11(11.5)	63(19.0)
Sand	91(38.7)	27(28.1)	118(35.6)
Chalk (Nzu)	128(54.5)	25(26.0)	153(46.2)
Snuff	45(19.1)	3(3.1)	48(14.5)
Ice	24(10.2)	13(13.5)	37(11.2)
Sour soup	2(0.9)	-	2(0.6)
I don't know	-	8(38.1)	8(11.4)
(b) Craving habit of respondents			
Crave for some items	154(55.4)	54(46.2)	208(52.7)
Do not crave	124(44.6)	63(53.8)	187(47.3)
Total	278(100)	117(100)	395(100)
		X²=2.82; df=1; P=0.09	
(c) Items craved for			
Clay	30(19.5)	31(57.4)	61(29.3)
Cola nut	57(40.4)	7(13.0)	64(32.8)
Rock	2(1.4)	3(5.6)	5(2.6)
Sand	47(33.3)	7(13.0)	54(27.7)
Chalk	24(15.6)	7(13.0)	31(15.9)
Ice	12(8.5)	16(29.6)	28(14.4)
(d) Reasons for craving for these items			
It stimulates appetite	27(17.5)	-	27(12.8)
Keeps me emotionally stable	44(28.6)	31(54.4)	75(35.5)
I just love eating them	59(38.3)	11(19.3)	70(33.2)
I do not have any reason	24(15.6)	15(26.3)	39(18.5)
Total	154(100)	57(100)	211(100)
		X²=24.91; df=3; P=0.00	

Table 4: reveals that 43.9% of rural respondents and 8.5% of the urban respondents forbid one type of food or the other ($\chi^2=46.22; P<0.001; df=1$). Some of the foods they forbid and the reasons why they forbid them are as follows- grasscutter (46%), prolongs labour; snail (12.0%), causes baby to salivate; Donkey (6.0%), leads to stubborn baby; pork, baby will like dirt (80%), and baby will be fat like a pig (20%) respectively.

Table 4: respondents on issues of forbidden foods in their locality.

	Rural	Urban	Total
(a) Responses			
Forbid some foods	122(43.9)	10(8.5)	132(33.4)
Do not forbid any food	156(56.1)	107(91.5)	263(66.6)
Total	278(100)	117(100)	395(100)
		X²=46.22; df=1; P=0.00	
(b) Reasons			
Prolongs labour	43(100)	3(100)	46(100) grass cutter
Baby salivates	9(100)	3(100)	12(100) snail
Leads to a big baby	20(87.0)	7(70.0)	27(81.1) beans
	7(25.0)	-	7(22.6) corn pap
	42(82.4)	-	42(77.8) heavy food
Not good for pregnant woman	3(10.7)	3(100)	6(19.4) corn pap
Delivery difficulty	3(13.0)	3(30.0)	6(18.2) beans
	3(5.9)	3(100)	6(11.1) heavy food
It causes weakness	18(64.3)	-	18(58.1) corn pap
	6(11.8)	-	6(11.1) heavy food
Baby crawls like snake	27(90.0)	-	27(81.8) snake
Baby will spite at people	3(10.1)	3(100)	6(18.2) snake
Leads to a stubborn baby	3(100)	3(100)	6(100) donkey
Baby will like dirt	12(100)	-	12(800) pork
Baby will be fat like a pig	-	3(100)	3(200) pork

Table 5: shows the 24 hour dietary recall. It revealed that about 60.3% of the respondents consumed staples from starchy roots, tubers, cereals, etc; 50.1% consumed vegetables; while 53.4% consumed fruits. About 63.3% consumed various types of soups. Nuts and seeds were consumed by less than half (45.6%) of the respondents.

Table 5: A 24-hour dietary recall (foods consumed by the respondents in the last 24 hours)

	Frequency	Percentage
(a) Starchy roots/tuber fruits and cereals (e.g. rice, maize, yam, plantain etc)	238	60.3
(b) Meat, fish, legumes, chicken, milk, egg, (e.g. snail, crayfish liver, etc).	102	25.8
(c) Vegetable group (e.g. bitter leaf, ugu, carrot, tomatoes, okazi, green, ora, etc)	198	50.1
(d) Fat and oil group (e.g. groundnut oil, palmoil, butter, margarine, etc.)	99	25.1
(e) Fruit group (e.g. orange, paw-paw, utu, udala, pineapple, cashew, mango, etc.)	211	53.4
(f) Herbs, spices, condiments and seasonings, (e.g. utazi, magi, ginger, ogiri, pepper etc.)	98	24.8
(g) Soup (e.g. ogbono, onugbu, akparata, egusi, isisa, achi, ofor soups etc)	250	63.3
(h) Nuts and seeds (e.g. ground, ukpa, ukwa, ugba, etc.)	180	45.6

*Total number exceeds 395 because of multiple response. Ugu-fluted pumpkin leaves; Utazi= Gongronema ratifolia; ogiri = Ricinus communis; Ogbono Dikanut Onugbu = Bitter leave; Ukazi = Gnetum Africana; Ora = Plerocarpus soyauxii; Green = Amaranthus hybridus; Udala = African star apple; Akparata = Afzelia Africana; Egusi = Melon seed; Isisa = Beni seed; Achi = Branchystegia eurycoma; ofor = Deterium microcarpa; Ukpa = walnut = Juglans carlifornica; Ukwa = African bread fruit; Ugba = parkia filicoidea

Table 6: shows the birth weight of the neonates. The prevalence of low birth weight (LBW) was 4.8%. There were significantly ($P < 0.05$; $df = 1$; $\chi^2 = 5.07$) more LBW neonates among urban mothers (8.5%) than among their rural counterparts (3.2%). None of the neonates was overweight.

Table 6 Neonatal Birth Weight Measurements

	Rural	Urban	Total
(a) Neonatal weight Range			
Low weight (< 2.5kg)	9(3.2)	10(8.5)	19(4.8)
Normal weight (2.5-4kg)	269(96.8)	107 (91.5)	376(95.2)
Over weight (>4kg)	-	-	-
Total 278(100)	117(100)		395(100)

$\chi^2 = 5.07$; $df = 1$; $P = 0.03$

Table 7: indicates that there were no significant ($P = 0.05$) relationship between maternal meal skipping, snacking habit, and craving and neonatal birth weight. However, there was a significant ($P < 0.05$) relationship between respondents food forbidding habit and neonatal birth weight ($P = 0.030$). Although there were more normal weight babies among those who did not forbid any food.

Table 7: Effect of maternal dietary practices on neonatal birth weight

	Neonatal birth weight (kg)		
	>2.5	2.5-4	Total
	F(%)	F(%)	
(a) Meal skipping			
Skip meal	9(6.5)	129 (93.3)	138(100)
Do not skip meal	10(3.9)	247(96.1)	257(100)
Total 19(4.8)376(95.2)			395(100)
		X² = 1.357; df = 1;p = 0.178	
(b) Snacking habit			
Eat snacks	19(4.9)	370(95.1)	389(100)
Do not eat snacks	-	6(100)	6(100)
Total 19(4.8)376(95.2)			395(100)
		X² = 0.308;df = 1; P=0.743	
(c) Craving habit			
Crave for some items	10(4.8)	198(95.2)	208(100)
Do not crave	9(4.8)	178(95.2)	187(100)
Total 19(4.8)376(95.2)			395 (100)
		X² = 0.000; df = 1; P = 0.590	
(d) Food for bidding habit			
Forbid some foods	6(11.3)	47(88.7)	53(100)
Do not forbid any food	13(3.8)	329(96.7)	342(100)
Total	19(4.8)	376(95.2)	395(100)
		X² = 5.667;df = 1; P = 0.030	

DISCUSSION

Findings on the dietary practices of the respondents showed that the respondents skipped one meal or the other in the day. More rural respondents than urban respondents skipped their meal, although this was not significant. Most of the respondents who skipped their meals did so because they were not hungry. This is as a result of poor knowledge of requirements during pregnancy. Ideally, mothers need to consume a significantly greater amount of food during pregnancy and quantity of food and nutrient consumption increases with gestational age of pregnancy. The findings of (6) are in line with the findings of this study, showing that, women consume little or no extra food during pregnancy and may consciously limit their intake for fear of developing large fetuses which they feel makes delivery more difficult, especially for those with small pelvic sizes.

Almost all the respondents ate snacks in one form or the other and at one point in time or the other. The major reason why many ate snacks was to suppress hunger, to replace meal, and to make up meals. This finding indicates a high level of food insecurity and poverty. It was observed that most of the snacks consumed by the respondents were nutrient dense foods; e.g. moin-moin (bean pudding), groundnut, okpa (bambara-nut pudding), akara (fried bean cake). Although, these are considered as snacks they could also be considered as meals or part of main meals and

should be encouraged since they can make substantial contribution to nutrient intake.

More than half of the pregnant women in Ebonyi State craved for food and non-food items. Items mostly craved for include clay, chalk, sand and cola nut. This observation is in line with that of (7) who stated that pregnant women crave for food and non-food items like clay, pickles, ice-cream and chocolate. During the focus group discussion, one of the participants reported that she knew of a pregnant woman who craved for the odour of human excreta, and for this reason, the woman in question visits the toilet more often than necessary, not necessarily to defecate but to perceive the odour of excreta. The reasons why women crave for one item or the other during pregnancy is yet to be established. Those who crave for the above mentioned items gave their reasons as-stimulation of appetite, and emotional stability among others. (1) stated that crave for clay might be as a result of the body's need for calcium at that point in time during a woman's life, but that there is no evidence yet to prove that calcium in clay are bioavailable. (7) views do not agree with that of (1) stated that if people craved what the body needs, we would all eat broccoli and less chocolates, but this is not always the case. More rural respondents than urban respondents just love eating these items. While more urban respondents than rural respondents ate these items for emotional stability. It was also

observed that more urban respondents compared to their rural counterpart ate them for no reasons.

Culturally, the respondents agree that there were foods forbidden in their locality, such foods are glasscutter, which they believe prolongs labour; donkey, because it leads to giving birth to a stubborn baby; corn pap, beans and heavy foods they believe lead to big baby that and difficult to deliver. Some of these foods forbidden by the respondents are nutritious foods which are highly required for foetal development. According to (8), the determinants of the health and nutritional status of women are socio-economic and cultural, since culture can affect nutrient/food intake of pregnant mothers through food prohibition, restriction or food taboo. However, (8) also noted that education can affect some of these practices. In one of the FGDs a respondents reported that although snails is prohibited in her area, she consumed it because she has been taught that it supplies the body with nutrients.

Information from 24-hour dietary recall revealed that most of the respondents consumed foods mostly from starchy roots and tubers in combination with soups. This finding is not surprising, because starchy roots and tubers are among the foods produced by the respondents. In traditional setting, food consumption is related to foods produced. (9) and (10) found out that all over Africa, people consume mostly starchy foods as staples. The National food consumption survey showed that these groups of food formed the

bulk of the Nigerian diet. Also, information on food procurement practices of the respondents revealed that a good number of the respondents produced their food.

CONCLUSION AND RECOMMENDATION

The objective of this study was to ascertain the effect of some maternal dietary practices on neonatal birth weight in rural and urban areas of Ebonyi state. A lower prevalence (4.8%) of LBW compared to national (12%) and earlier reported hospital recorded figure for Ebonyi state (49.9%) was obtained with the urban having a higher (8.5%) LBW babies than rural (3.2%) mothers. This is an indication of the effectiveness of the maternal and child care programme in Ebonyi State. The monotonous diets, high level of snack consumption and reasons for consuming them displayed a high level of food insecurity and poverty. There, were no difference in meal skipping habits, food craving and snacking patterns; however, there were significant difference in the reasons for these habits. These practices had no effect on birth weight except for cultural adherence to forbidden foods. More rural mothers adhered strictly to culturally forbidden foods and more LBW weight neonates (11%) were found among mothers who forbid some foods than those who did not (3.8%), indicating that these habits do have detrimental effect on neonates. There is still need for more intensive nutrition education by professional nutritionists/Dietitians to further reduce the percentage LBW to the barest minimum.

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