

## ORIGINAL RESEARCH ARTICLE

# Identifying pregnant women who would adhere to food taboos in a rural community: a community-based study

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## Abstract

Poor maternal nutrition, especially in rural settings, adversely affects pregnancy and birth outcomes. In many local communities, pregnant women have food taboos with consequent depletion of vital nutrients. To facilitate early identification and prompt counseling, this study aimed at describing pregnant women who are likely to keep food taboos. Data was collected from 405 pregnant women that attended antenatal care at health facilities in Saki East Local Government of Oyo state, Nigeria. Sociodemographic characteristics of the women were described using means and proportions. Using logistic regression analysis, maternal characteristics significantly associated with adherence to food taboos were identified. The data was analysed using SAS 9.2. Factors associated with food taboos were teen age, primigravidity, low body mass index, lack of formal education, and low monthly family income. Health workers should have a high index of suspicion for food taboos among pregnant women with the identified risk factors. (*Afr J Reprod Health* 2012; 16[3]: 67-75).

## Résumé

Une mauvaise nutrition maternelle, surtout en milieu rural, affecte négativement les résultats de la grossesse et la naissance. Dans de nombreuses communautés locales, les femmes enceintes ont des tabous alimentaires à l'appauvrissement conséquent de nutriments vitaux. Pour faciliter l'identification précoce et le conseil rapide, cette étude visait à décrire les femmes enceintes qui sont susceptibles de garder les tabous alimentaires. Les données ont été recueillies auprès de 405 femmes enceintes qui ont assisté à des soins prénatals dans les établissements de santé dans l'Administration Locale de Saki de l'Est dans l'État d'Oyo, au Nigeria. Les caractéristiques sociodémographiques des femmes ont été décrites en utilisant des moyens et des proportions. En utilisant l'analyse de régression logistique, les caractéristiques maternelles significativement associés à l'adhésion à des tabous alimentaires ont été identifiées. Les données ont été analysées à l'aide de SAS 9.2. Les facteurs associés à des tabous alimentaires étaient l'âge, l'adolescence, la primigravidité, l'indice du poids maigre, le manque d'éducation formelle, et le faible revenu familial mensuel. Le personnel de santé doit avoir un indice élevé de suspicion de tabous alimentaires chez les femmes enceintes avec des facteurs de risque identifiés (*Afr J Reprod Health* 2012; 16[3]: 67-75).

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**Keywords:** Maternal nutrition, food taboos, pregnancy, rural community, prevention

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## Introduction

Maternal nutrition in pregnancy is an important reproductive health issue. It affects the growing baby indirectly via materno-fetal transfer, and directly post-partum, via lactation<sup>1</sup>. Calories, proteins, vitamins and other important food elements needed by the developing foetus and the growing child are thus provided by the mother.

Maternal nutrition is also a modifiable factor by which pregnancy and birth outcome indices can be improved<sup>2</sup>. Adequate intake of certain food elements during pregnancy improves birth weight and labour spontaneity<sup>3-6</sup>. Children who experienced iodine deficiency during foetal developmental stage and early childhood suffer cognitive impairment<sup>7</sup>.

There is growing evidence about the relationship between foetal nutritional exposure

and adult health<sup>8-11</sup>. Nutrition in early life plays significant role in adult health. A recent study observed improved haematopoiesis at adult age of 12 weeks among mice antenatally exposed to genistein compared to their counterparts who were not<sup>12</sup>. Maternal vitamin B12 during pregnancy was associated with the cognitive functions of their offspring at 9 years of age. Other studies also showed the significant role played by maternal nutrition on the health of offspring in the later years. In some mothers, a combination of low vitamin B12 and high folate have been associated with increased risk of adult adiposity and type 2 diabetes in the offsprings<sup>13-15</sup>.

Among newborns of a cohort of Spanish women, there was positive association between diet quality in early pregnancy, and adjusted birth weight and birth length<sup>16-18</sup>. Furthermore, placental and cord blood vitamin A was positively associated with neonatal birth outcomes and children's neurodevelopment in later childhood<sup>19</sup>.<sup>20</sup>. Babies born to mothers who received iron supplementation in Zimbabwe had higher birth weight than their counterparts whose mothers did not receive iron supplementation during pregnancy<sup>21</sup>.

Dietary practices during pregnancy are influenced by different factors. Several studies concluded that dietary counseling influences maternal nutrition. Pregnant women attending antenatal clinics receive nutritional counseling which will likely influence their dietary practices<sup>22-25</sup>. Younger, less educated, multiparous (having two or more children) pregnant women with high pre-pregnancy body mass index (BMI) were found to have poor quality diet. Culture and beliefs also influence maternal eating patterns during pregnancy. Grandmothers' well respected position in some rural communities became a channel for providing nutritional education to younger women of reproductive age. This reportedly influenced the younger women positively<sup>26, 27</sup>.

One of the common eating patterns reported during pregnancy is avoidance of certain food items. Egwuatu (1986) has previously documented food taboos among pregnant women of Igbo tribe in Nigeria. Eating snails during pregnancy was believed to predispose the baby to excessive salivation and vomiting. Eating yam, or 'foofoo'

was believed to make the baby big and difficult to deliver, while eating of pig would make the baby spotted at birth<sup>28</sup>.

In a study in Tanzania, sixty-nine percent of pregnant women reported food taboos. In that community, eating fish was believed to hurt the mother's abdomen and also cause late delivery; eating farm meat would make the child take on characteristics of farm animals. The high prevalence of severe anaemia during pregnancy in that district was linked to malaria parasitemia, hookworm infections, and food taboos. The authors recommended that intervention efforts be focused on these areas in order to reduce the burden of anaemia in the community<sup>29</sup>. Due to food taboos, 26% of pregnant women in Indonesia also avoided fishes, meat, vegetables and chicken eggs. According to the women, eating fishes and other food from a river will cause difficulties during delivery because the foetus would be upside down in the womb, while eating chicken eggs will make them behave like chicken during delivery and would make the delivery last longer.<sup>30</sup>. Similar food practices were also found among groups of pregnant women in India<sup>31</sup>. Some of the women reported that eating certain food items will cause prolonged and difficult labour. Others said certain food items will make the baby's head too large to fit through the mother's pelvis during delivery<sup>28, 32</sup>.

There is currently paucity of data on factors associated with food taboos among pregnant women in African communities. Additionally, while existing literature reported reasons for the practice, factors that can be used to identify pregnant women at risk for this practice have not been fully documented. The current study aims to identify and describe mothers at risk of food taboos in Saki East Local Government area, Nigeria. We hypothesize that pregnant women at risk for adhering to food taboos in this rural community can be identified early based on pre-identified risk factors linked to observance of the taboos. Early identification of such pregnant women by applying appropriate screening tools during antenatal clinics will enable health care workers to provide timely nutritional counseling in typical communities.

## Methods

The study was carried out in Saki East Local Government area, Oyo State, Nigeria, between April 2001 and February 2002. The area was a rural community with a population of 61,414. Data was collected from pregnant women attending the four primary health care centres in the community. Given that the health care centres were located within walking distances and that they offered free antenatal care, the centres seemed to be accessible and available to all women in the community. We therefore anticipated that a large proportion of pregnant women in the community would be captured by our data collection at these centres.

We estimated sample size using Epi-Info version 6 statcalc program. The minimum sample size was based on our primary hypothesis for the larger study performed to identify factors associated with low birth weight (LBW) delivery among women in the community under study. First, we determined sample size needed to study each potential risk factor in the study such as anemia and hypertension. We also assumed 20%<sup>33</sup> as prevalence of LBW to within 5% points of the rate, at 95% confidence interval, to estimate the sample size. The latter method yielded a greater minimum sample size of 245<sup>33</sup>. We anticipated that this sample would equally be sufficient for the sub-study on factors associated with adherence to food taboos.

As each pregnant woman came to book for antenatal care, a trained research assistant explained the study protocol and asked if they were willing to participate in the study. Among pregnant women who came for antenatal clinics at the maternity centers, a total of 421 who were willing to participate and consented were enrolled into the study. However, ten women chose to have their antenatal care in the nearby general hospital. Four women were referred to the general hospital on account of pre-eclampsia. Two other women were excluded on account of incomplete records and inconsistent responses leaving a total of 405 women for the study.

Gestational age was determined by each woman's self-report of her last menstrual period. The average gestational age at recruitment was 30 weeks. Participation was voluntary, and verbal

consent was obtained from each woman at booking after providing a detailed explanation of the elements of the study and of the informed consent process. Approval for the study was obtained from the College of Medicine, University of Ibadan. We also obtained written approval from the head of maternal and child health unit of Saki East Local Government area, Oyo State, Nigeria.

Qualitative data was first obtained from a focus group discussion with ten pregnant women selected by simple random sampling to gather information on knowledge, attitudes, beliefs and practices of the community regarding pregnancy and birth outcomes. Findings from the discussion were utilized in adapting the questionnaire for this study.

The semi-structured questionnaire was translated and administered in the local dialect of Yoruba. It was back-translated to English to ensure unambiguity. The questionnaire was adapted from one previously used by Lawoyin and Oyediran (1992). They were administered during the initial visit, and updated at delivery to ensure that all questions were answered by each participant and responses properly entered. Questionnaires were administered by nurses/midwives and senior community health workers who were working at the maternity centers and were trained as research assistants for the study. The eye-level beam balance weight scale with a height scale was used to measure participant's weight and height. The height was measured at booking. Weight was measured during each antenatal visit. Maternal weight at booking and height were used to estimate BMI for this analysis. Body mass index was calculated by dividing the woman's weight in kilograms by the square of her height in metres.

## Statistical Analysis:

Information obtained from the FGD were analyzed for content and theme recognition. The data was entered with Epi Info version 6.04-database system for microcomputers, validated and cleaned. Frequency distributions, bivariate and multivariable analysis were done using SAS 9.2 software. Teenage was defined as maternal age between 13 to 19 years, short stature was taken as height  $\leq 150$  cm<sup>34</sup>, those with no formal education

were women who did not attend primary school; and BMI category was chosen to allow for reasonable number of participants in each category and avoid cells with zeros or small samples in the cross-tabulations (Table 1). Monthly income less than N8,700 (\$54.2)/month per household was considered low income<sup>35</sup>. We observed that 8.4% of the women started antenatal care in first trimester, 54.8% in the second trimester and 36.8 in the third trimester. While dichotomising this variable, in order to avoid zeros or too small numbers in the cells we categorised those who started antenatal care in first and second trimesters as early.

Baseline socio-demographic data such as age, height, highest level of education, level of income were reported using descriptive measures (mean, median, standard deviations, and proportions). Cross-tabulations and chi-square tests were used to examine the relationships between food taboos and dichotomised variables including age, height, BMI, level of income, parity, entry into antenatal care, frequency of meal intake per day, and belief that food intake affects birth weight. Logistic regression analysis was performed to determine the adjusted odds ratios for adherence to food taboos during pregnancy. The variables listed were included in the model because they were either found to be significant in the bivariate analysis or were found in current literature to be potential risk factors for adherence to food taboos. All tests of significance were 2-sided and the level of significance was set a priori at 0.05 for all statistical tests. The study protocol was approved by the institutional review board.

## Results

The major themes identified from the focus group discussion were (1) knowledge about nutrition in pregnancy such as effects of food on maternal and child health, (2) relationship between nutrition in pregnancy, antenatal care and birth weight, (3) frequency of meals during pregnancy and (4) observance of food taboos and reasons for food adherence. While most women believed that baby's weight depended on what the mother ate during pregnancy, some believed that a baby has a destined birth weight that one could not possibly

influence. Many of them had good knowledge of nutrition in pregnancy but opinions were fairly divided on the type of food usually avoided during pregnancy. Most participants agreed that the practice of food adherence existed among pregnant women in the community and gave suggestions on reasons for the practice.

Table 1 presents the results of frequency distribution of the socio-demographic data collected from the 405 participants. Fifteen percent of the women were teenagers (13-19 years), mean age was 25.4 years (SD 5.8), 6.2% were short-statured ( $\leq 150$  cm), 21.7% had BMI  $< 22.9$  kg/m<sup>2</sup>. Only 1.5% of the women had more than high school education and 57.3% lived in families with low income less than N8,700 (\$54.2) per month, 25.2% were primigravida, 37.3% commenced antenatal care in the third trimester while 13.3% adhered to food taboos. Common among food taboos reported were that eating snails or okro during pregnancy will make the baby drool saliva, eating bush animals will inflict evil spirit on the pregnant woman resulting in delivery of a monster; and drinking cocoa containing beverages will make the baby very big and difficult to deliver.

Results from bivariate analysis showed that the odds of adherence to food taboos was higher among teenage participants than those that were 20 years old or more (OR 2.81, CI 1.45- 5.45;  $p < 0.01$ ). Those with BMI  $22.9$  kg/m<sup>2</sup> or less had a higher odds of keeping food taboos than women who had higher BMI (OR 1.98, CI 1.19-3.27;  $p = 0.01$ ). Odds of adherence to food taboos was higher for primigravid women than women who already had one or more children (OR 4.27, CI 2.34-7.81;  $p < 0.001$ ); and those that ate less frequently (1-2 times per day) were more likely to keep food taboos than women who ate three times or more per day (OR 2.10, CI 1.13- 3.91;  $p = 0.012$ ). The odds of adherence to food taboos was higher among women from low income families earning less than N8,700 (\$54.2) per month (OR 2.16, CI 1.20, 3.87;  $p = 0.01$ ).

Multivariable analysis was done using logistic regression to determine variables that were significantly associated with adherence to food taboos. Teenage women significantly adhered to food taboos compared to older women (aOR 2.77,

**Table 1:** Description of study population

	N = 405	%
<b>Age (yrs)</b>		
15-19	61	15.1
20-24	126	31.1
25-29	111	27.4
≥30	107	26.4
<b>Height(cm)</b>		
≤150	25	6.2
>150	380	93.8
<b>Body mass index(kg/m<sup>2</sup>)</b>		
≤ 22.9	88	21.7
≥ 23.0	317	78.3
<b>Highest level of education</b>		
No formal education	109	26.9
Primary	266	65.7
High School	22	5.4
Post High School	6	1.5
<b>Level of Income</b>		
Low ( less than N8700 or \$54.2/month)	232	57.3
Middle N8700 (\$54.2)-- N20000(\$125)/month	137	33.8
High (>N20000 or \$125.0/month)	36	8.9
<b>Parity</b>		
Primigravida	102	25.2
1 – 2	138	34.1
3 – 4	123	30.4
5 – 6	36	8.9
>6	4	1.0
<b>Birth Interval (years)</b>		
1 – 2	70	17.3
>2 – 3	143	35.3
>3 – 4	48	11.9
>4	42	10.4
1st Pregnancy	102	25.2
<b>Entry to Antenatal Care</b>		
1st Trimester	24	5.9
2nd Trimester	230	56.8
3rd Trimester	151	37.3
<b>Food Taboos in Pregnancy</b>		
Yes	54	13.3
No	345	85.2
Not sure	6	1.5

\$=US Dollar

CI 1.26- 6.33; p=0.02). Women that had BMI 22.9 kg/m<sup>2</sup> or less, significantly keep food taboos than those who had higher BMI (aOR 2.39, CI 1.07- 5.37; p=0.04); while not attending primary school also significantly increased the odds of food taboos compared with those who went to school (aOR 2.66, CI 1.18- 5.96; p=0.02). Primigravidity,

compared with having one or more children, was significantly associated with food taboos (aOR 9.72, CI 4.17-22.69; p<0.001). Low family income was significantly associated with avoidance of food items during pregnancy than those whose family income was N8700 (\$54.2) or more per month (aOR 5.84, CI 2.57- 13.28; p<0.001).

**Table 2:** Unadjusted and Adjusted Odds Ratios for Food Taboos Among Pregnant Women

	OR	95% CI	aOR	95% CI
<b>Age (yrs)</b>				
<20	2.81	1.45, 5.45	2.77	1.26, 6.33
≥20	1.00		1.00	
<b>Height(cm)</b>				
≤150	0.54	0.12, 2.35	0.84	0.17, 4.15
>150	1.00		1.00	
<b>Body mass index(kg/m<sup>2</sup>)</b>				
≤ 22.9	1.98	1.19, 3.27	2.39	1.07, 5.37
≥ 23.0	1.00		1.00	
<b>Highest level of education</b>				
No formal education	1.17	0.68, 2.03	2.66	1.18, 5.96
Educated	1.00		1.00	
<b>Level of Income</b>				
Low (<N8700 or \$54.2/month)	2.16	1.20, 3.87	5.84	2.57, 13.28
High (≥N8700 or \$54.2/month)	1.00		1.00	
<b>Parity</b>				
Primigravida	4.27	2.34, 7.81	9.72	4.17, 22.69
Multiparous	1.00		1.00	
<b>Meal frequency per day</b>				
1 – 2	2.10	1.13, 3.91	1.57	0.76, 3.26
≥3	1.00		1.00	
<b>Entry to Antenatal Care</b>				
Early (1st & 2nd Trimesters)	1.04	0.58, 1.88	0.97	0.47, 2.00
3rd Trimester	1.00		1.00	
<b>Believe food affects birthwt.</b>				
Yes	1.04	0.35, 3.12	1.10	0.23, 5.65
No	1.00		1.00	

## Discussion

In our study, we found that pregnant women were more likely to adhere to food taboos if they were teenagers, had low BMI (<22.9 kg/m<sup>2</sup>), did not have any formal education, had low monthly family income, or if they were primigravid. These factors are easily identifiable for public health interventions meant to identify early and treat or ameliorate occurrence of poor nutrition practices among mothers visiting antenatal care services.

Community leaders usually impose cultural and traditional beliefs on women and children who remain the vulnerable populations in most communities. Husbands, mothers-in-law, and fathers were assigned significantly dominant role in decision making in some communities<sup>36</sup>. In a

study done in rural Malawi on factors influencing choice of place of delivery, women would rather deliver in other places than those decided by their husbands among other decision-makers<sup>37</sup>. In certain cultures, women could not negotiate issues about sexuality such as the use of condom as a result of undue cultural male dominance<sup>38, 39</sup>. Additionally, a national family health study in India showed that due more to community effects, girls were less likely than boys to receive supplemental food and more likely to be malnourished<sup>40</sup>. Often times, recipients of the cultural practices are left without an understanding of why they do what they do. This also means that health related interventions affecting women should also involve key decision makers such as men.

In our study almost one-thirds of the women did not attend school, and a huge 65.7% had only primary education (Table 1). Our study found an association between low level of formal education and adherence to food taboos. Women who did not attend primary school were more likely to adhere to food taboos than others who received primary school education or higher. Considering the proportion of women who did not receive formal education in the community, further studies to confirm this finding is recommended so as to provide additional justification for policies in favor of female education. In a study among 300 women of childbearing age in two rural communities in Nigeria, income of the women and non adherence to detrimental cultural practices such as food distribution in the household in favour of men, correlated directly with good nutritional status. Further, the study found that education had a mediating or modifying influence on cultural practices. More educated women such as the teachers had higher incomes and were able to maintain good nutritional status. The teachers also adhered less to detrimental cultural practices. The authors and other workers reiterated the need for female education<sup>40, 41</sup>.

Additionally, this study found a positive relationship between teen age and adherence to food taboos. There is paucity of data looking at the role that teen age plays in determining the choice of food, and food avoidance during pregnancy. However, it is possible that teen age mothers were more likely to be influenced by mothers-in-law, husbands and community leaders who have been reported to be perpetrators of cultural beliefs. There are evidences in literature in support of higher prevalence of undernutrition among pregnant adolescents, the resultant anemia, and the adverse effects this has on pregnancy outcomes such as LBW at delivery. We found an association between low BMI and adherence to food taboos<sup>42,43</sup>. Our findings therefore agree with the conclusion of Yassin et al (2004), that health workers should identify the dietary practices of adolescent pregnant women early. In the study by Yassin, Sobhy, and Ebrahim (2004), low maternal weight below 50 kg was found to be a risk factor for dietary practices during pregnancy.

Limitations of our study include the use of weight at entry into antenatal care to determine the BMI. Participants entered antenatal care at different gestation ages, so we could not obtain weight at the same gestational age for all of them. In addition, participants did not have records of pre-pregnancy weight we could use to determine pre-pregnancy BMI. Since routine ultrasound assessment was not done on the women, we relied on self-report of last menstrual period to estimate the gestational age at booking. The recall of the last menstrual period may not be correct in the case of all the respondents. However, since the questionnaire mostly addressed food practices and personal history, we do not anticipate that these limitations will significantly affect our findings.

## Conclusions

Maternal nutrition in pregnancy is pivotal to pregnancy outcomes. Food taboos have been identified as one of the factors contributing to maternal undernutrition in pregnancy, especially in rural African communities. We have identified factors that are associated with this practice in the community under study. While we recommend further studies to establish these relationships, for the purpose of early identification and prevention, we encourage health workers to have a high index of suspicion of food taboos among women with the identified risk factors.

## Acknowledgement

We appreciate the efforts of Taiwo Lawoyin, MD and Emily Harville, PhD for helping with study design and interpretation of results respectively. We thank Oyo State local government service commission and the Ministry of Health, Nigeria for allowing us to use their health centres for the study and providing support for data collection.

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