Full Length Research Paper

Household food security among pregnant women in Ogun - East senatorial zone:
A rural – urban comparison

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The burden of disease caused by adverse pregnancy outcomes, including maternal and child morbidity and mortality, in developing countries, has been enormous. An important contributor to good pregnancy outcome is the nutritional status of the mother, which is a factor of adequacy or otherwise of the dietary intake in pregnancy. Household food security is a determinant of adequate dietary intake. This study assessed and compared household food security among 720 rural and urban pregnant women from Ogun-East senatorial district using semi-structured, interviewer-administered, six-item, short form food security questionnaire. Data analysis was done using International Business Machine (IBM) statistical package for the social sciences (SPSS) version 14.00. The result was presented as proportions, with the relevant test statistic. Household food security was higher among the rural respondents than their urban counterparts. More urban respondents were food insecure without hunger and with hunger compared with their rural counterparts. There was no significant difference (p = 0.070) between the household food security status of both groups of respondents. Economic empowerment of women and improvement in food availability even during the planting season will go a long way in improving the food security status of many households.

Key words: Household, food, security, pregnant, women.

INTRODUCTION

Nutrition is an important characteristic of all living things, including man. It is vital to the health and well being of individuals throughout the life cycle. Maternal nutritional status is of great concern to health professionals because of the effects it has on both the pregnant woman and her unborn child. Many countries in sub-Saharan Africa have recorded very high morbidity and mortality rates among pregnant women and children under five years of age.

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Nigeria has a maternal mortality ratio greater than the regional average (Harrison, 1997; Hill et al., 2007; Federal Ministry of Health (FMOH), 2007). Amongst other important causes of pregnancy-related morbidity and mortality is poor maternal nutritional status. Pregnancy places extra demands on the body systems and processes, increasing the vulnerability of such women to various forms of nutritional disorders, including deficiency states and nutritional anaemia (Bowman and Rusell, 2001; Ladipo, 2000). High malnutrition rates among pregnant women have been reported in sub-Saharan Africa, ranging from 60% in Samburu and 37% in Marsabit districts of Kenya, respectively to almost 20% in Southeastern Nigeria (Carter 2006; Okwu et al., 2007). Malnutrition affects humans throughout the life cycle, with increased vulnerability among those in developing countries. It therefore presents a multi-dimensional challenge, encompassing both physical and psychosocial elements (Erdman et al., l2012).

The Millennium Development Goals recognise the importance of adequate nutrition to sustainable development. The first goal addresses the eradication of extreme poverty and hunger and seeks to half the proportion of people who suffer from hunger by the year 2015. Poverty is the main underlying cause of malnutrition and its determinants (Sachs and McArthur, 2005). Almost half of the world's population live on less than $2 (USD 2.00) a day. In developed (more affluent) countries, fewer than 5% of all children under five are malnourished, while in poor (developing) countries, as many as 50% are malnourished (Tesfahun, 2009; World Bank, 2001). The United Nations World Food Programme reported an estimated 9 million people to be in need of humanitarian assistance, in the horn of Africa alone. The situation has greatly increased the vulnerability of women, particularly in pregnancy, and children to the adverse consequences of malnutrition (World Food Programme (WFP), 2011). The World Health Organization estimated that over 850 million people are undernourished worldwide, with the vast majority (over 90%) living in developing countries (WHO, 2002). The Food and Agriculture Organization confirms the ever-increasing number of undernourished people worldwide, mainly in the poorer (and developing) nations of the world (Food and Agriculture Organization (FAO), 2004).

A major determinant of nutritional status is the dietary intake of an individual which is in turn affected by the availability and utilization of food within the household. Household food security therefore determines to a large extent, the nutritional status of members of the household concerned, particularly for women and children. Food security is the condition in which all have access to sufficient food to live healthy and productive lives (Haile et al., 2005). It is dependent on many factors including food production, importation and donations, household income, intra-household decision-making and resource allocation (Amanor and Amanor, 2009). Food insecurity is not only a limited or uncertain availability of nutritionally adequate and safe foods but also the inability to acquire acceptable foods in socially acceptable ways. Severe food insecurity and hunger can lead to food intakes that are continuously insufficient to meet dietary energy requirements (Gladwin et al., 2001). Increased food supplies do not automatically enhance access to food by the poorer groups of society (Irumu and Butt, 2004). The Nigeria Food Consumption and Nutrition Survey, carried out between 2001 and 2003, found 60% of severe household food insecurity occurring in the moist savannah regions (southwest) of the country (Maziya-Dixon et al., 2004). A study measuring household food insecurity in selected local government areas of Lagos and Ibadan, southwest Nigeria found a prevalence of 70% for household food insecurity. Food secure households were 28% in Lagos and 23.7% in Ibadan. In Lagos, 37.2% of households studied were food insecure without hunger, compared with 45.7% in Ibadan. Only 12% of households in Lagos and 4.7% in Ibadan were food insecure with severe hunger (Sanusi et al., 2006).

This study therefore assessed household food security among pregnant women accessing ante-natal care services at selected primary health centres in rural and urban areas of Ogun – East senatorial district.

METHODOLOGY

Study area

Ogun state has twenty Local Government Areas, spread across the three senatorial districts in the state. It is located in southwestern Nigeria and bounded in the north by Oyo and Osun states, in the east by Ondo state, in the south by Lagos state and in the west by the Republic of Benin. It has a population of 4.2 million people. The Ogun-East senatorial zone is made up of nine Local Government Areas.

Study design

A cross-sectional comparative study was carried out among pregnant women at selected Primary Health Centres in rural and urban areas of Ogun state, between 4th December, 2012 and 6th May, 2013.

Study population

Representative samples of pregnant women of reproductive age, utilizing ante-natal care services at selected rural and urban Primary Health Centres were studied.

Sample size determination

Using a formula for the comparison of two independent proportions,

$N = (Z_{1-\alpha/2} + Z_{1-\beta})^2 [P_1(1-P_1) + P_2(1-P_2)] / (P_1-P_2)^2$
$N = (1.96 + 0.84)^2 [0.3(0.7) + (0.2(0.8)] / (0.3 - 0.2)^2$
$N = 290.008$

Taking into account 20% non-response rate, incompletely-filled questionnaires and other unforeseen challenges with data collection,

the calculated sample size (N) was rounded up to 360 per group. A total of 720 pregnant women were studied in all.

Sampling technique

Multi-stage sampling technique was used in this study. The first stage involved the selection of one rural and one urban LGA by simple random sampling. Sagamu LGA was selected as the urban study location, while Remo-North LGA was selected as the rural study location by simple random sampling. The second stage of the sampling involved the selection of two wards from each of the selected LGAs by simple random sampling. In Remo-North LGA, wards 7 and 9 were selected from the 15 existing wards, by simple random sampling (balloting). The Primary health care services (PHCs), located within the selected wards, constituted the rural study sites. In Sagamu LGA, wards 5 and 8 were selected through a process of simple random sampling (balloting). The PHCs located within the two selected wards constituted the urban study sites. Therefore, a total of four PHCs was utilized for the study in both LGAs. All pregnant women who were willing to participate in the study were recruited consecutively till the desired sample size was reached.

Data collection methods

Five interviewers (research assistants) were trained over a period of two days prior to commencement of the study. They were all undergraduate students of the College of Health Sciences. The interviewer administered semi-structured questionnaires which were used to collect data on respondents' socio-demographic characteristics and household food security status. The questionnaire was translated into the local language (Yoruba) and back into English, to ensure clarity, standard and uniformity.

Data management

Data analysis was done using the IBM Statistical Package for the Social Sciences (SPSS) version 14.00. Proportions, means and frequencies were calculated, presented as tables, charts and was compared between the two groups using the appropriate statistical tests. Chi square test and Fisher's exact test were used to test for association between categorical variables. Level of significance was placed at p = 0.05. Respondents' household food security was assessed using the short form six-item questionnaire. All responses in the affirmative (yes) were given a score of one (1), while negative responses were given a score of zero (0) as documented in litera-ture (Gulliford, 2004). The first item on the short form household food security questionnaire was split into two due to its double barrel nature in order to avoid ambiguities noticed during the pretest. A score of two or less qualified the respondent to be classified as food security; a score of three to five was classified as food insecure without hunger; while a score of six to seven was classified as food insecurity with hunger.

Ethical considerations

Ethical approval was obtained from the Ogun State Primary Health Care Board, Ogun State Ministry of Health, as well as the Health Research and Ethics Committee of Olabisi Onabanjo University Teaching Hospital, Sagamu. Written approval was also sought from the Local Government Health Authorities in Sagamu LGA and Remo-North LGA, through the Medical Officer for Health/Director, Primary Health Care Department. Participants' informed consent was obtained verbally and by thumb printing, prior to the

commencement of the study. Strict confidentiality was ensured throughout the course of the research. Participants were free to withdraw from the study, if they deemed it necessary and were assured that such would not affect the quality of care received at the facility.

RESULTS

A total of 720 pregnant women participated in the study at the selected primary health centres.

Age and marital status of respondents

Majority (51.7 of rural and 53.9% of urban) respondents were aged between 26 and 33 years. This was followed by those aged 18 to 25 years, comprising 27.2 and 26.45% of rural and urban respondents, respectively. The mean age of rural women (28.14 ± 5.49 years) was not significantly different (p=0.553) from that of the urban women (28.38 ± 5.53 years). Most (over 95%) of respondents in both urban and rural areas were married. Both areas had an equal proportion (3.1%) of single respondents (Table 1).

Respondents' level of education

Among both groups of respondents, only 3.3 and 3.4% of rural and urban women, respectively had no formal education; 14.5% of the rural respondents and 17.3% of the urban had primary/Koranic education. Majority (61.3 rural and 63.7% urban) of respondents had secondary education; while 20.9% of rural women compared with 15.6% of urban women had some form of tertiary education or the other.

Household monthly income and decision making on spending pattern

The mean household income of rural respondents (NGN 25,061 ± 12,458) was significantly lower (p = 0.004) than the mean household income (NGN 28,124 ± 10,585) of urban respondents. Most rural (64.7%) and urban (69.4%) respondents reported household incomes between NGN 20,001.00 and NGN 40,000.00. Only 0.2% of rural respondents compared with 2.8% of their urban counterparts reported household incomes greater than NGN 60,000.00. There was a significant difference (p > 0.001) between the household income of rural and urban study participants. Decision making on spending pattern of the household income was done jointly by respondents and their spouses in 46.7% of the rural households and 49.4% of the urban households. About 38% of respon-dents in both groups reported that their spouses alone determined the pattern of household spending. In 5.2% of ruralhouseholdsand3.9%ofurbanhouseholds,thespouses'

Table 1. Age and marital status of respondents.

Age (years)	Location		Test statistic
	Rural	Urban (n=360)	
	Frequency (%)	Frequency (%)	
18 – 25	98 (27.2)	95 (26.4)	
26 – 33	186 (51.7)	194 (53.9)	X^2=0.561; df=3; p=0.905
34 – 41	70 (19.4)	64 (17.8)	
42 – 49	6 (1.7)	7 (1.9)	
Mean age	28.14 ± 5.49	28.38 ± 5.53	t=0.593; p=0.553
Marital status			
Single	11 (3.1)	11 (3.1)	
Married	344 (95.6)	345 (95.8)	X^2=0.113; df=2; p=0.945
Separated	3 (0.8)	4 (1.1)	
Divorced	2 (0.5)	0 (0.0)	

Rural; n=360. Urban; n=360.

Table 2. Household monthly income and decision making on spending.

Household income (Naira)	Location		Test statistic
	Rural	Urban	
	Frequency (%)	Frequency (%)	
1 – 20,000	122 (33.8)	80 (22.2)	
20,001 – 40,000	233 (64.7)	250 (69.4)	X^2 = 25.693; df=3; p=0.000.
40,001 – 60,000	5 (1.3)	20 (5.6)	
60,001 – 80,000	1(0.2)	10 (2.8)	
Mean income	25,061±12,458	28,124±10,585	t=-2.013; p=0.004
Decision making on household spending			
Respondent alone	37 (10.3)	33 (9.2)	
Respondent and spouse	168 (46.7)	178 (49.4)	X^2=1.279; df=3; p=0.734
Spouse only	136 (37.8)	135 (37.5)	
Spouse's relatives	19 (5.2)	14 (3.9)	

Rural; n=360. Urban; n=360.

relatives were involved in the decision making process on household spending. There was no significant difference (p = 0.734) between both groups (Table 2).

Respondents' ability to spend earnings on food and household size

Most respondents in the rural (56.1%) and urban (59.2%) areas were able to spend their earnings freely on food. Only 12.8% of rural women and 14.4% of urban women were able to spend freely occasionally. A greater proportion of rural (31.1%) and urban (26.4%) were not able to spend as they desired on feeding. There was no significant difference (p = 0.358) between both groups. The mean household size among rural respondents was 3.65, while that of the urban women was 3.69. There was no statistically significant difference between the means (p = 0.753). Almost 27% of rural respondents had a household size of less than three people compared with 24.7% of urban respondents. More rural respondents (4.4%) also had a household size of 10 or more persons compared with 2.8% of urban respondents. There was no significant difference (p = 0.165) between both groups (Table 3).

Proportion of income spent on feeding and household food security status

Most respondents (38.3%) in the rural and urban areas spent 50 to 74% of their income on feeding. Only 32.3%

Table 3. Respondents' ability to spend earnings on food and household size.

| Ability to spend on food | Location | | Test statistic |
| | Rural | Urban | |
	Frequency (%)	Frequency (%)	
Yes	202 (56.1)	213 (59.2)	
No	112 (31.1)	95 (26.4)	X^2=2.055;df=2; p=0.358
Sometimes	46 (12.8)	52 (14.4)	
Household size			
Less than 3	97 (26.9)	89 (24.7)	
3– 5	221 (61.5)	215(59.7)	
6– 8	26 (7.2)	46 (12.8)	X^2=10.442;df=7; p=0.165
10 and above	16 (4.4)	10 (2.8)	
Mean	3.65±1.56	3.69±1.56	t=0.315; p=0.753

Rural; n=360. Urban; n=360.

Table 4. Proportion of income spent on feeding and household food security status.

| Proportion spent (%) | Location | | Test statistic |
| | Rural | Urban | |
	Frequency (%)	Frequency (%)	
90 and above	40 (11.1)	37 (10.3)	
75 – 89	66 (18.3)	87 (24.2)	
50 – 74	138 (38.3)	138 (38.3)	X^2 = 6.292; df=4; p=0.178
25 – 49	80 (22.3)	59 (16.4)	
Less than 25	36 (10.0)	39 (10.8)	
Household food security status			
Food secure	223 (61.9)	193 (53.6)	
Food insecure without hunger	113 (31.4)	141 (39.2)	X^2=5.330; df=2; p=0.070
Food insecure with hunger	24 (6.7)	26 (7.2)	

Rural; n=360. Urban; n=360).

of rural respondents and 27.2% of urban respondents spent below 50% of their income on feeding. There was no significant difference (p=0.178) between the proportion spent by rural and urban respondents. Household food security was higher (61.9%) among the rural respondents compared with the urban (53.6%) women. Food insecurity without hunger was reported among 31.4% of rural respondents compared with 39.2% of their urban counterparts. Food insecurity with hunger was reported by only 6.7% of rural women and 7.2% of urban women. There was no significant difference (p=0.070) between the household food security status of the rural women and their urban counterparts (Table 4).

DISCUSSION

The mean age of rural respondents was 28.14 ± 5.49 years while that of urban respondents was 28.38 ± 5.33 years. There was no statistically significant difference

between both means (p = 0.553), among both groups of pregnant women, more than 50% were aged between 26 and 33 years. Majority (over 95.0%) of respondents in both rural and urban locations were married, a finding similar to those from other studies involving antenatal care clients (Okwu and Ukoha, 2008).

The importance of household food security to good nutritional status has been emphasized over several years by the international community as well as local researchers (World Food Programme (WFP), 2011; FAO, 2004; United Nations Children's Fund (UNICEF), 2009; Sanusi et al., 2005). A higher proportion (61.9%) of rural respondents was food secure, compared with 53.6% of urban respondents. More urban respondents were food insecure without hunger (39.2% urban; 31.4% rural) and with hunger (7.2% urban; 6.7% rural). Household food security status was not significantly associated with participants' location (p = 0.070). These findings are somewhat similar to those from a Nigerian study, in which household food security was 52% in the rural areas surveyed,

and food insecurity was reported as 48%. The difference however is that in this study the rural respondents had a higher value (61.9%) of food security (Obamiro et al., 2003). The household food security status recorded in this study was far higher than that reported by researchers in Ile-Ife, Nigeria, where as many as 65% of households were food insecure (Ajao et al., 2010). The Nigeria Food Consumption and Nutrition Survey results also buttress the food insecurity status of many households in southwest Nigeria, as reported in this study. However, the proportion of household food insecurity with hunger is only 6.7% for rural households and 7.2% for urban households in this study, in contrast to findings from the national survey (Maziya-Dixon et al., 2004). Other studies from southwestern and south-south regions of Nigeria reported food insecurity levels as high as 70 and 61.8%, respectively in contrast to findings from this study (Sanusi et al., 2006; Omuemu et al., 2012). In Oromiya Zone of Ethiopia, researchers found household food insecurity to be as high as 73.1%, which sharply contrasts with findings from this study. Determinants of food security in their study included household size, educational status, average farm land size as well as average per capita production of food in Kilograms (Haile et al., 2005).

It is also important to note that in Nigeria, like in many other developing countries of sub-Saharan Africa and Asia, a wide seasonal variability in food supply and availability exists, due to the poor food storage and preservation practices in these regions (FAO, 2004). Also some researchers are of the opinion that variables related to food supply are more potent determinants of food security than those related to food demand. Food insecurity is further viewed as a demand concern affecting the poor's access to food, than a supply concern affecting availability of food at the national level (Feleke et al., 2005). Food insecurity has also been associated with reduced quality and variety of dietary intakes and a number of poor developmental outcomes in children as well as underweight in adults (Tarasuk, 2001; Saha et al., 2009; Gulliford et al., 2004). The Federal Government through the Federal Ministry of Agriculture and Rural Development, made efforts to address the rising food insecurity in the country. It operated a pilot project in Kano, with three sites, tagged ''Supporting Programmes for Food Security'' (SPFS). The success recorded in this pilot scheme has led to a scale-up to the national level, which was formally launched in 2001, with a mandate to reach at least thirty thousand (30,000) households (FAO). Due to the multi-dimensional issues related to food security, many institutions and governments avoid optimal investment of their scarce resource to tackle it (Bogale and Shimelis, 2009).

Despite the numerous challenges regarding food security at national, local and household levels, governments and community leaders must show commitment to increase food production, storage, distribution, price regulation and limitation of family size, women empowerment, gender mainstreaming and other factors associated with household food security. Health education targeted at community leaders, opinion leaders, policy makers and even women themselves, on the importance of household food security to health, need to be instituted and evaluated at regular intervals, in order to stir up sustainable actions.

Conclusion

Household food security was higher among rural respondents than their urban counterparts. economic empowerment of women and strategies to improve food availability and distribution within households, will go a long way in ensuring that many more families are food secure, thereby improving the chances of survival of mothers and their children.

Conflict of Interests

The author(s) have not declared any conflict of interests.

ACKNOWLEDGEMENT

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