



## **Socio-demographic Factors Associated with Nutritional Practice during Pregnancy among Pregnant Mothers Attending Federal Tertiary Health Facilities in Ebonyi State, Nigeria**

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### **Abstract**

Maternal under-nutrition is an emerging public health problem across the world, disproportionately impacting women in developing countries. This study assessed nutritional practice during pregnancy and its associated socio-demographic factors among pregnant mothers attending antenatal clinics at Alex Ekwueme Fethal Teaching Hospital Abakaliki (AE-FETHA) Ebonyi State. This is a hospital-based study that adopted a cross-sectional survey research design. A self-developed instrument was used to elicit information from the sample of 328 participants. Data analysis was done using frequency, percentage, and multivariate logistic regression at 0.05 alpha level. The findings revealed that 56.7 per cent of the respondents eat food three times in a day, 59.5 per cent eat variety of foods in moderation, 48.5 per cent eat fruit and vegetables occasionally. Moreover, 66.8 per cent are not on any supplement/vitamins, whereas 83.2 per cent do not drink enough water during pregnancy. The multivariate logistic regression adjusted for socio-demographic factors shows that marital status, occupation, and religion are significantly associated with nutritional practice during pregnancy among pregnant women ( $p \leq 0.05$ ). Based on the findings, the study recommended an advanced nutritional education on the important of adequate intake of water, supplement and fruits among mothers during pregnancy. Also using the concerned stakeholders including well-informed religious and traditional leaders to address the socio-demographic factors associated with nutritional practice during pregnancy.

**Keywords:** Nutritional practice, Socio-demographic factors, Pregnant women, Ebonyi State

### **Introduction**

Maternal under-nutrition is an emerging public health problem across the world, disproportionately impacting women in developing countries (Muonde, Olorunsogo, Ogugua, Maduka, & Omotayo, 2024). Nutrition during pregnancy is among the primary environmental factors strongly associated with pregnancy and prenatal outcomes (Tsegaye, Tamiru, Belachew, 2020). Research has reported that healthy nutritional practice in pregnancy is



required to improve immune systems, guarantee proper fetal growth and prevent pregnancy complications (Amare, Tura, Semahegn, Teji Roba, 2022). The nutritional practices such as adequate energy intake, diversified diet, using fruit, vegetables, and animal products helps to ensure the women enter pregnancy and lactation without deficiencies (Amare et al., 2022; Aleke, Mong, Obande-Ogbuinya, Omaka-Amari, Afoke, Ngwakwe, David et al., 2023). More so, it helps to improve immune systems, lower sickness rate, and prevent pregnancy complications among women (Anyasor, Olowu, 2017). World Health Organisation has reported that during pregnancy the caloric intake of food is expected to increase by approximately 300 kcal/day (WHO 2021). This have been affirmed by other studies who reported an approximate of 80,000 kcal intake during pregnancy to maintain a full term pregnancy and to improve both maternal, fetal metabolism and placental growth (WHO 2016; Kominiarek & Rajan, 2016; Aleke et al., 2023).

Research has documented several findings on the significant impact of adequate maternal nutrition in pregnancy, however, despite the nutritional requirements and benefit from adequate nutritional intake in pregnancy, maternal under nutrition in low and middle-income countries has been reported as an underlining cause for more than 3.5 million deaths and disabilities (Wagaye, Endeshaw, Eden, 2021; Joshi, Mardik, Verma, Rajagopalan, Siddiqui 2023). Maternal malnutrition during pregnancy increases the risk of gestational anemia, hypertension, miscarriages, and fetal deaths during pregnancy, preterm delivery, and maternal mortality (Wagaye et al., 2021). Further, research have implicated poor nutrition or protein energy malnutrition and the consequent micro and macro-nutrient deficiencies as significant causes of various maternal morbidity and mortalities in developing countries including Nigeria (WHO 2013; United Nations Children's Fund [UNICEF], 2013). Poor nutritional practice in pregnancy has contributed to the most severe health problems affecting children and their mothers especially in Nigeria (Akpa et al., 2022; Amare et al., 2022).

A study has reported that approximately 50% of maternal and childhood deaths were attributed to under nutrition in Nigeria (Obiakor-Okeke 2014). In Ebonyi state, the proportion of undernourished mothers and children in separate national surveys were reported to increase from 16.2% to 20.6% in 2013 and 2015 respectively (National Bureau of Statistics 2015; National Population Commission 2014; Umeokonkwo, et al., 2020; Aleke et al. 2023). Such increase may be associated to poor nutritional practice and its associated factors among mothers (Ekwochi, et al., 2016; Chakona & Shackleton, 2019). Hence, in Ebonyi state, pregnant mothers may be faced with different factors affecting their nutritional practice in pregnancy. Such factors like low socio-economic status, environment, culture, food insecurity, poverty, and lack of money may be affecting mother's adequate nutritional practices in pregnancy. Moreover, several related studies have attributed these factors including marital status, occupation, and religion as contributing factors to inadequate nutritional intake during pregnancy (Oni & Tukur 2012; Ekwochi et al., 2016; Tela et al., 2020; Ningtyias & Kurrohman, 2020; Ramulondi, et al., 2021; Akpa et al., 2022; Amare et al., 2022).

It is worrisome to note that despite the impact of nutritional deficiency in pregnancy and its associated factors as revealed in several studies both in Nigeria (Ekwochi, et al. 2016; Oluleke, et al., 2016; Maduforo, 2010), and other countries (Parmar, et al., 2013; Wolllelaw, Wubie & Taddele, 2018; Tela, et al., 2020; Yismaw and Teklu, 2022). With the proportion of undernourished pregnant mothers and children in Ebonyi state as reported in separate national surveys and the increase from 16.2% to 20.6% in 2013 and 2015 respectively (National Bureau of Statistics 2015; National Population Commission 2014). There is little or no studies empirical studies to unravel the socio-demographic factors associated with nutritional practice during Pregnancy among Pregnant Mothers in Ebonyi State.



It is against this point of view that the study objective was to assess nutritional practice during pregnancy and its associated socio-demographic factors among pregnant mothers attending antenatal clinics at Alex Ekwueme Fethal Teaching Hospital Abakaliki (AE-FETHA) Ebonyi State. It is hope that when the factors affecting nutritional practice among pregnant mothers are identified, it would better assist the government, nutritionist, health educators, policy makers and other relevant stakeholders in the preventive efforts.

## **Methods and Materials**

### **Study design and setting**

A descriptive cross-sectional survey was conducted from February 10 through August 12, 2023 at the Antenatal Clinics of Alex Ekwueme Federal Teaching Hospital Abakaliki (AE-FETHA), Ebonyi State South East of Nigeria. AE-FETHA is located in the heart of Abakaliki, the capital of Ebonyi State. It is the federal and the biggest hospital in Ebonyi State (Anoke, 2015). It is also a training institution for nursing students among others. Generally, the hospital renders primary as well as specialist services to those in need within and outside Ebonyi State. It has an average of 330.8 deliveries per month, and serves as a referral center to other secondary and primary health facilities within the State and its environs (Anikwe et al., 2020). Ebonyi State is one of the Igbo States in the Southeast Nigeria with the projected population of 1,244,671 women of reproductive age in 2022 (National Bureau of Statistics 2023). In Ebonyi state there is an existing cultures, traditions and religious activities. Some of this activities when ongoing influence what, how and when to eat especially women during pregnancy and while breastfeeding. It is a common to observe women in Ebonyi State discuss foods they like to eat but avoid them during pregnancy, and those they do not like to eat due to one factor and another. The scenarios has prompted the current to assess nutritional practice during pregnancy and its associated socio-demographic factors among pregnant mothers attending antenatal clinics at Alex Ekwueme Fethal Teaching Hospital Abakaliki (AE-FETHA) Ebonyi State.

### **Population of the study**

The population of the study comprised all the 3936 pregnant mothers attending Antenatal clinics at the time of the study in Alex Ekwueme Federal Teaching Hospital Abakaliki (AE-FETHA) and who consented to participate in the study. The exclusion criteria were based on pregnant mothers who are below age limit of 15 years due to the fact that the reproductive age of women is usually 15 years and above. Also, participants who are non-indigenes of Ebonyi State and those who were either sick or absent during the period of the study were all excluded.

### **Sample and sampling techniques**

The sample size of the study was 394 pregnant mothers. This represented 10% of the total population and was based on Nwanas' rule of thumb which state that when the population is a few thousands, 10% will suffice (Nwana, 2007). The study adopted the use of convenience sampling method to draw 394 pregnant mothers attending antenatal clinic in Alex Ekwueme Federal Teaching Hospital Abakaliki (AE-FETHA). Convenience sampling is a non-probability sampling method that enables the researchers access to the respondents based on the geographical proximity, availability at a given time, and willingness to participate in the research. The respondents were accessed in the health care facilities on the days of antenatal services. This procedure yielded 394 pregnant mothers used in the study



## **Instrument and method of data collection**

A self-developed Nutritional Practice and Associated Factors Questionnaire was used for data collection. The questionnaire was organized in two sections: A and B. Section A elicited the socio-demographic characteristics such as age, marital status, Education levels, occupation, family income status, religion and parity of the participants, while the B generated data on the pregnant mothers' 'nutritional practice. Respondents were required to use tick (√) to indicate the nutritional practice among pregnant mothers. The instrument was face validated by five experts in the Department of Human Kinetics and Health Education, Ebonyi state university Abakailiki. In order to ascertain the reliability of the instrument, the questionnaire were pretested among thirty (30) pregnant mothers attending antenatal clinics at other healthcare facilities that was not part of the sample of the study but possess a similar characteristics. The instrument was collected back on the spot and assigned "even" and "odd" numbers. The responses were compared for degree of internal consistency, using Cronbach Alpha statistic. The reliability test yielded a strong internal consistency of 0.85 thus, was considered very high reliable to be used for the study. This is in line with the study of Ogbazi and Okpala (1994) who reported that if reliability coefficient is .60 and above, the instrument is deemed appropriate.

Prior to the distribution of questionnaires, formal introduction of the study was given by the researchers and informed consent obtained from all the prospective participants. The researchers conducted the administration and distribution of the questionnaire to all the pregnant mothers attending Antenatal clinics at Alex Ekwueme Federal Teaching Hospital Abakaliki (AE-FETHA) Ebonyi State. The items of the questionnaire were organized to elicit responses from the participants without any bias. The administration of the questionnaire survey lasted about six months. The administration and filling of the questionnaire was strictly conducted without coercion but based on respondents' volition and consent. We also, offered explanations and assistance to some respondents who sought for it. However, out of 394 copies of questionnaire distributed, 328 were properly filled out representing 83 percent return rate and used for data analyses.

## **Data analysis**

Data collected were cross-checked for completeness of information and responses. Those properly filled were analyzed using IBM SPSS version 25 (Statistical Package for Social Science). The serial number was assigned to each question for easy identification and for correct data entry and analysis. The data was analyzed using frequencies, percentages, and multivariate logistics regression statistics. The multivariate logistics regression analysis was employed to estimate the adjusted odds ratios (AOR) along with 95% confidence intervals (CIs) to identify factors that is influencing nutritional practices among pregnant mothers. The results were presented using tables.



## Results

**Table 1: Socio-demographic Characteristics of the Pregnant Mothers (N= 328)**

Characteristics	f (%)
<b>Age group</b>	
15-25 years	83 (25.3)
26-35 years	154 (47.0)
36-45 years	91 (27.7)
<b>Marital Status</b>	
Married	167 (50.9)
Single	66 (20.1)
Divorced	45 (13.7)
Widowed	50 (15.2)
<b>Level of Education</b>	
Primary	62 (18.9)
Secondary	168 (51.2)
Tertiary	89 (29.9)
<b>Occupation</b>	
Civil Servant	35 (10.7)
Artisans	130 (39.6)
Traders	115 (35.1)
House wife	48 (14.6)
<b>Family Income Status (Naira)</b>	
<30000	103 (31.4)
30000-99000	150 (45.7)
100,000 and above	75 (22.9)
<b>Religion Affiliation</b>	
Christian	222 (67.7)
Muslim	35 (10.7)
Traditional	71 (21.7)
<b>Parity (Number of birth)</b>	
1	42 (12.8)
2	64 (19.5)
3	98 (29.9)
4	62 (18.9)
5	62 (18.9)

Table 1 shows that 394 pregnant mothers were enrolled in this study however, three hundred and twenty eight (328) returned the questionnaire properly filled giving a response rate of 83 percent. The findings revealed that the age bracket of the respondents varied widely thus, majority at the age bracket of 26-35 years have the highest percentage of 47.0%, followed by the age of 36-45 years (27.7%) and the age bracket of 15-25 years with (25.3%). The marital status of the pregnant mothers also varied widely as majority were married (50.9 %), single mothers (20.1%), divorced (13.7%) and widowed (15.2%). On their education levels, majority of the participants with the percentage of 51.2% attended secondary schools, while 29.9% attended tertiary institutions, and 18.9% attended primary schools. Regarding occupation, majority of the pregnant mothers (39.6%) were artisans, 35.1% were traders, and 14.6% were house wife whereas 10.7% were civil servants. The family income status of pregnant mothers ranges from #30000-99000 with the percentage (45.7%), <#30000 (31.4%), and #100,000 and above (22.9%). Regarding religion, the majority of the participants were Christians (67.7%), traditional religion (21.7%), and Muslims (10.7%). In terms of parity (number of birth), the greater number of the participants with the percentage of 29.9% had given birth three times, followed by the percentage of 19.5% who had given birth two times, whereas the percentage



(18.9%) had given birth four and five times respectively, and (12.8%) had given birth once, (see Table 1).

**Table 2: Nutritional Practice among Pregnant Mothers in Ebonyi State, Negeria (N =328)**

<b>Items</b>	<b>Frequency</b>	<b>Percentage</b>
<b>How many times do you eat food in a day</b>		
Once	9	2.7
Twice	27	8.2
Thrice	186	56.7
When I feel like	106	32.3
<b>What type of food do you eat most of time</b>		
Carbohydrates-rice meals	50	15.2
Protein-rich meals	83	25.3
Variety of foods in Moderation	195	59.5
<b>How often do you eat Fruits and Vegetables</b>		
Daily	67	20.4
Once in a week	91	27.7
Twice in a week	11	3.4
Occasionally	159	48.5
<b>Are you presently on any supplement or Vitamins</b>		
Yes	109	33.2
No	219	66.8
<b>Do you drink plenty of water when pregnant</b>		
Yes	55	16.8
No	273	83.2

Table 2 shows nutritional practice among pregnant mothers in Ebonyi State. The table shows that the pregnant mothers with the highest percentage of 83.2% do not drink enough water when pregnant. Whereas (66.8%) of the pregnant women admitted they are not on any supplement or vitamins at present. The Table further revealed that (56.7%) eat food three times in a day, and (59.5%) eat variety of foods in moderation whereas the percentage of mothers (48.5%) eat fruits and vegetables occasionally during pregnancy.



**Table 3: Table 3: Logistic Regression of Nutritional Practices of Pregnant Women and its Covariates (*n* =328)**

Characteristics	Yes (%)	No (%)	AOR (95.0% CI)
<b>Age group (Years)</b>			
15-25	55 (26.6)	28 (23.1)	1
26-35	102 (49.3)	52 (43.0)	1.301 (0.66-2.58)
36-45	50 (24.2)	41 (33.9)	1.875(0.79-4.48)
<b>Marital</b>			
Married	73 (44.2)	94 (57.7)	1
Single	36 (21.8)	30 (18.4)	1.07(0.48 – 2.42)
Divorced	29 (17.6)	16 (9.8)	2.38(0.95 – 5.97)*
Widowed	27 (16.4)	23 (14.1)	1.14 (0.46 – 2.81)
<b>Level of Education</b>			
Primary	51 (24.6)	11 (9.1)	1
Secondary	129 (62.3)	39 (129)	0.751 (0.34-1.67)
Tertiary	13.0 (207)	121 (58.7)	0.050 (0.02-1.14)
<b>Occupation</b>			
Civil Servant	7 (4.2)	28 (17.2)	1
Artisans	69 (41.8)	61 (37.4)	2.31(0.67 – 7.98) *
Traders	66 (40.0)	49 (30.1)	3.08 (0.86 – 11.00) *
House wife	23 (13.9)	25 (15.3)	2.45(0.63 – 9.50) *
<b>Family Income Status (Naira)</b>			
<30000	160 (73.4)	62 (56.4)	1
30000-99000	18 (8.3)	17 (15.5)	0.353(0.15-0.85)
100,000 and above	40 (18.3)	31 (28.2)	0.409(0.21-0.79)
<b>Religious Affiliation</b>			
Christian	106(54.6)	116 (86.6)	1
Muslim	29 (14.9)	6 (4.5)	7.35(2.80 – 19.31) *
Traditional Religion	59 (30.4)	12 (9.0)	6.63(3.18 – 13.82) *
<b>Parity(number of birth)</b>			
1	29 (14.0)	13 (10.7)	1
2	49 (23.7)	15 (12.4)	1.204 (0.42-3.46)
3	62 (30.0)	36 (29.8)	0.638 (0.24-1.67)
4	36 (17.4)	26 (21.5)	0.432 (0.15-1.23)
5	31 (15.0)	31 (25.6)	0.340 (0.11-1.01)

The multivariate logistic regression analysis adjusted for socio-demographic factors associated with nutritional practice during pregnancy among pregnant mothers attending Federal Tertiary Health Facilities in Ebonyi State, Nigeria shows that, marital status, occupation and religious affiliation were statistically associated with nutritional practice among pregnant mothers. For instance, marital status shows that being divorced were 2 times (AOR = 2.38; CI = 0.95 – 5.97) more likely than being married to be associated with nutritional practice during pregnancy. Regarding the occupation of the participants, being traders were 3 times (AOR = 3.08; CI = 0.86 – 11.00), and Artisans, and House wife 2 times (AOR = 2.31; CI = 0.67 – 7.98, AOR = 2.45; CI = 0.63 – 9.50) respectively more likely than being civil servant to be associated with nutritional practice during pregnancy. On the religious affiliation: Being Muslim were 7 times (AOR = 7.35; CI = 2.80 – 19.31), and



Traditional Religion 6 times (AOR = 6.63; CI = 3.18 – 13.82) respectively more likely than being Christian religion to be associated with nutritional practice during pregnancy.

## Discussion

The present study is among the first to determine the socio-demographic factors associated with nutritional practice during pregnancy among pregnant mothers attending federal tertiary health facilities in Ebonyi State, Nigeria. The finding revealed amongst others that majority of pregnant mothers do not drink enough water when pregnant, and greater number are also not on any supplement or vitamins at the time of the survey. The findings is not expected and thus a surprise. It is a surprise because fruits and vegetables and other supplement or vitamins is required in pregnancy for healthy growth and development of the baby (UNICEF, 2022). Moreover, drinking plenty of water is required to stay hydrated and supports the proper delivery of nutrients through the blood to the baby, and prevent constipation, hemorrhoids and urinary tract infections for the mother (Aleke, et al. 2023;WHO 2021). WHO and FAO have also recommended adequate consumption of at least two servings of fruits and three servings of vegetables among pregnant mothers per day. WHO further revealed that an estimated 16.0 million (1.0%) disability-adjusted life years and 2.8% of deaths worldwide (1.7 million) was due to poor intake of fruits, vegetable, supplement or vitamins water (WHO 2022). Although, the current finding of the study may be attributed to poor household water supply, lack of pipe born water, and current level of poverty in Nigeria and various communities of ebonyi state. This may have affected pregnant mother's access to food supplements and water intake. The findings however is in line with the study who revealed that almost half of the pregnant mothers do not eat fruits and other supplements that are high in protein needed by the fetus due to food taboos (Adinma 2017; Fasola, et al., 2018). The findings was also in line with the study who reported poor/or lack of availability of adequate water supply particularly in dry seasons as a factor impacting pregnant mothers from drinking adequate water in pregnancy (Cameron, Chase, & Suarez, 2021). The current findings however disagrees with the study who reported quality of drinking water and other fluid volume consumed by pregnant mothers aids development of teeth and bones in the growing fetus (Henderson & Lenders, 1999). This agreement and disagreement with reference to the findings could be attributed to varied geographical locations, subject' composition and other demographic factors associated with the setting of the study.

The result of the multivariate logistics regression adjusted for socio-demographic factors shows that marital status, occupation and religion were statistically associated with nutritional practice among pregnant mothers. On the marital status, the findings may be associated to the fact that a divorced pregnant mother may not be willing to uphold the cultural belief of a community on nutritional practice (Abebe, Beyene, Mulat, 2021). The finding is in agreement with the study who reported marital status as factor influencing nutritional practice among pregnant mothers (Fasola, et al., 2018; Oluleke, et al., 2016; Tela, Gebremariam & Beyene, 2020). Nevertheless, the findings disagree with the study in Ethiopia who reported that marital status were negatively associated with nutritional practice in pregnancy (Arzoaquoi, et al., 2015). This disagreement might be associated to the fact that, in some communities, women follow the dictate of their husband and respect the ideas and/or beliefs of their husbands unlike other communities where reverse is the case (Tela, Gebremariam, Beyene 2020).

Regarding the occupation of the participants, adjusted odd ratio shows that Traders, Artisans, and House wife were more likely than being civil servant to influence nutrition practice in pregnancy. This findings may be attributed to the food insecurity, poverty and lack of money





that is currently observed across communities in Nigeria due to pandemic and subsidy removal. The findings supported the study who reported that nutritional practice can be influenced by the availability and accessibility of food especially among those who only attended primary education (Teshome, Zinab, Wakjira, and Tamiru 2020). The current finding was also in line with study that reported occupational status and lack of formal education as a predictor of adequate nutritional practice (Oni and Tukur 2012). However, the findings disagree with the study who reported that occupation had no significant relationship with nutritional practice (Ademuyiwa, Sanni 2013; Ekwochi, et al., 2016). This agreement and disagreement with reference to the findings may be associated with the varied geographical locations, subject' composition and other demographic factors associated with the setting of the study.

With regard to the religious affiliation: Muslim and Traditional Religion were more likely than being Christian to predict nutritional practice in pregnancy. The current finding is in consonance to the study who reported a significant association between religious affiliation and nutritional practice in pregnancy (Tela, et al., 2020). The findings agrees with the studies that revealed that people of every region avoids certain food especially during pregnancy for reasons associated with religion (Oni, Tukur 2013; Zepro 2016; Ningtyias, Kurrohman 2020; Aleke, et al., 2023). However, the current finding opposed the studies who reported that religious affiliation had no significant association with nutritional practice (Parmar, et al., 2013; Oluleke, et al., 2016). This agreement and disagreement with reference to the findings could be attributed to varied communities, religious affiliation, and cultural beliefs.

## Conclusion

The present study has revealed factors influencing nutritional practices among pregnant mothers of Ebonyi State, Nigeria. The finding revealed amongst others that majority of pregnant mothers do not drink enough water when pregnant, and greater number are also not on any supplement or vitamins. The study further revealed the socio-demographic factors associated with nutritional practice among pregnant mothers attending Federal Tertiary Health Facilities in Ebonyi State. Such factors as marital status, occupation and religion. This study concluded by way of recommending the need for nutritional education to address factors influencing adequate nutritional intake especially intake of water, supplement or vitamins during pregnancy. Also using the concerned stakeholders including a well-informed religious and traditional leaders to address the socio-demographic factors associated with nutritional practice during pregnancy. Further, there is need by government to generate public health policies that ensure nutritious food availability, and to strongly encourage funding agencies to prioritize nutritional research to improve maternal and child health through adequate nutritional practices.

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