

**Spatial Differences in Quality of Maternal Health Service in Primary Health Centers of Enugu state, Nigeria**

**ABSTRACT**

**Aim:** The aim of the study was to determine how adequate were the resources, (equipment and personnel), process, (client-provider interaction), and outcome components of quality of maternal health service in urban and rural primary health centers of Enugu state, Nigeria.

**Study design:** Cross-sectional analytical study design.

**Place and duration of study:** Primary health centers in Enugu State, Nigeria, between January and March 2013.

**Methodology:** A three stage sampling method was used to select 540 clients in 18 of 440 primary health centers in the state. The clients were women who attended antenatal and postnatal care in the health centers. Outcome measure was clients true satisfaction with maternal health service also denoted as satisfaction index. and it was assessed by proportion of clients who were satisfied with antenatal, and postnatal care, **were** ready to use the health centers again, and willing to recommend them to others for same services.

**Results:** No health center had adequate equipment, 16.7% of health centers had adequate health manpower and 16.7% had good client provider interaction. Only a minor proportion of clients, (urban 7%; rural 24.1%) delivered in the health centers. On part of clients, 64.8% in urban were truly satisfied, as compared to 75.6% in rural. Predictors of clients true satisfaction included being a client in urban, (AOR=0.6, 95% CI: 0.4- 0.9), client unmarried, (AOR=0.3, 95% CI: 0.1- 0.5), and being unemployed/housewife, (AOR=2.0, 95% CI: 1.3- 4.5).

**Conclusion:** The structure and process components of quality of maternal health service in primary health centers in the study area were deficient. Also, utilization of health centers for delivery services was poor. The clients of maternal health service seem to focus more on providers of healthcare and their interactions with them than the health system and its deficiencies hence **were** easily satisfied with the

services received. To reduce the maternal death burden in Nigeria there is need for adequate attention on rural areas, the primary health care system and the provision of client oriented health services at all levels of care. More health workers should be employed, and more equipment supplied in-order to improve the quality of maternal health service in the primary health centers.

9  
10 *Keywords:* quality, maternal health, primary health centers, Enugu state, Nigeria.  
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### 13 **1. INTRODUCTION**

14  
15 Maternal health service is composed of premarital care, antenatal care, delivery services, and postnatal  
16 care and its aim is to reduce maternal morbidity and mortality [1]. Maternal health is an important  
17 determinant of national and global well being. This is because every individual, family and community is  
18 at various times involved in pregnancy and child delivery [2]. However, of all the human development  
19 indicators, maternal mortality ratio portrays the greatest disparity between the developed and developing  
20 countries. This is because maternal mortality ratio in developing countries is about fifteen times higher  
21 than that in developed region [3].  
22

23 Nigeria, with a maternal mortality ratio of 576 maternal deaths per 100,000 live births has the second  
24 largest burden of maternal deaths globally [4]. Nigeria with an approximate two percent of the world's  
25 population contributes to about fourteen percent of the world maternal deaths with an annual estimate of  
26 40,000 deaths due to pregnancy, delivery and post partum complications [3]. Also, for every death that  
27 **occurs**, about 20-30 other women suffer short and long term disabilities. **The** United Nations Population  
28 Fund estimates that 2 million women worldwide suffer from vesico-vaginal fistulae and 40% of them are in  
29 Nigeria, with obstructed labour being the main cause [5]  
30

31 Records show that countries that have achieved low maternal mortality rates paid much attention to good  
32 quality care [6]. A good example is Sri Lanka, **where** quality improvements in maternal healthcare helped  
33 in reducing its maternal mortality ratio from between 80 and 100 maternal deaths per 100 000 live births

34 in 1975 to below 30 per 100 000 live births in the 1990s [7]. The need for quality maternal healthcare was  
35 further buttressed by results of a study in Anambra State, southeast Nigeria which concluded that the  
36 problem of maternal mortality may not be with utilization but with quality of services rendered [8].

37  
38 There are several approaches in assessing the quality of care. A classic model was developed by Avedis  
39 Donabedian for health care services as a whole [9,10]. He classified quality under three categories –  
40 structure, process and outcome. According to him, the structural component includes human, material  
41 and organizational resources required for provision of services, the process component refers to services  
42 rendered while outcome is the result of these services on patients and their care providers. It also  
43 includes patient satisfaction with care received.

44  
45 In Nigeria, maternal health indices are worse in rural when compared to urban [4,11], and the rural area is  
46 where majority of populace reside [12]. Also, in most rural communities in Nigeria the primary health  
47 centers are the main health facilities, yet in a study in 2003 on quality of care, only 18.5% of 1500 primary  
48 health care facilities covered had the capacity to provide emergency obstetric care [13]. A similar study in  
49 southwest Nigeria, revealed great lack in equipment and supplies needed for provision of emergency  
50 obstetric care in rural local government areas resulting in absence of these services [14]. Subsequently,  
51 another study advocated the need for regular evaluation of quality in primary health care services as the  
52 researchers opined that such regular assessments will promote client oriented health services [15].

53  
54 The World Bank has severally advised developing countries to ensure that their health services are  
55 client oriented [16,17], and Economists have been of the opinion that consumers of healthcare are in  
56 favour of high quality care even if that will attract increased charges [18]. Furthermore, Annis in his study  
57 concluded that perceived quality of care was one of the most important determinants of patient's choice of  
58 provider and willingness to pay [19], and from another study came the conclusion that people were willing  
59 to pay for primary health care services if there were quality improvements [20]. The aim of the study was  
60 to determine how adequate were the resources (equipment and personnel), process (client-provider

61 interaction) and outcome components of quality of maternal health service in urban and rural primary  
62 health centers of Enugu state, Nigeria.

## 63 64 **2. MATERIAL AND METHODS**

### 65 66 **2.1 Setting**

67 The study area is Enugu State, one of five states in southeast geopolitical zone of Nigeria. It is made up  
68 of 17 Local Government Areas of which 5 are designated as urban and covers a total area of 7,618  
69 square kilometers with a population of 4,881,-500 people [21]. The inhabitants are mainly of Igbo ethnic  
70 nationality and are predominantly Christians. In urban areas, the major occupation of the people are  
71 trading and formal employments while in rural, it is mainly subsistence farming and animal pasturing.

72  
73 The health system of Enugu State is based on District Health System and presently the state has seven  
74 district hospitals, 440 primary health centers, two specialist hospitals, two teaching hospitals and 384  
75 private health facilities [22]. Enugu State at the time of this study offered free maternal and child  
76 healthcare in all its health facilities, including the primary health centers.

### 77 78 **2.2 Study Design**

79 The study employed a cross sectional analytical ~~study~~ design.

### 80 81 **2.3 Study Instruments**

82 The study instruments consisted of an inventory of personnel and equipment in use at the health centers,  
83 an observation checklist for client-provider interaction during antenatal care and a semi-structured  
84 questionnaire.

### 85 86 **2.4 Study Participants**

87 The study population consisted of women who attended both antenatal and postnatal care in the selected  
88 primary health centres. A minimum of four antenatal care visits qualified the women for inclusion in the  
89 study. The infant welfare/ immunization clinics of the selected health centres served as points of  
90 recruitment for clients.

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## 92 **2.5 Sample size determination**

93 | The minimum sample size for the study was determined by the formula used to compare two independent  
94 | proportions [23]. From a study in an urban primary health center in southwest Nigeria, 81.4% of the  
95 | clients were satisfied with antenatal care [24], while from a rural health center in southeast Nigeria 94.3%  
96 | of the clients were satisfied with antenatal care [20]. A total of 270 clients were estimated for each study  
97 | group based on type 1 error ( $\alpha$ ) of 0.05 in a two sided test and power of 0.8.

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## 99 **2.6 Sampling Technique**

100 | The study employed a three stage sampling technique. In the first stage, a simple random sampling  
101 | technique of balloting was used to select three Local Government Areas each in urban and rural areas of  
102 | the state. In the second stage, three health centres in each of the six selected Local Government Areas  
103 | were randomly selected by the balloting method. In the third stage, a systematic random sampling  
104 | technique was used to select clients as they presented in the immunization/ infant welfare clinics of  
105 | selected health centers on each day of data collection. The average attendance at the health centres for  
106 | immunization services in the last six months served as sampling frame, (1021 in urban and 1429 in rural)  
107 | and by dividing this population by the sample size of 270 in each group, one out of every four women in  
108 | the urban and one out of every five ~~women~~ in the rural area were selected. The index client was selected  
109 | among the first four clients in urban and first five clients in rural area by a simple random sampling  
110 | method through balloting using the health facility register of clients on each day of data collection. The  
111 | research assistants had a register for all clients that were included in the study and this was cross  
112 | checked before a new client was included to ensure that no client was selected twice.

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## 114 **2.7 Data collection methods**

115 | In assessing the personnel and equipment **available at the health centers**, the minimum standards for  
116 | primary health care services in Nigeria by the National Primary Health Care Development Agency  
117 | (NPHCDA) for equipment and personnel was **used [25,26]**. This was used to assess the structural  
118 | component of quality of care and was utilized **in** the eighteen health centers included in the study. The

119 process component included the interpersonal and technical components and was assessed using the  
120 NPHCDA guideline on primary health care facility quality assessment, schedule D [27]. This was used to  
121 assess the client provider interaction during antenatal care and was utilized in one health centre in each  
122 of the six selected Local Government Areas. The health center was selected by a simple random  
123 sampling technique of balloting. The outcome measure of the study was assessed using a pre-tested,  
124 semi-structured questionnaire which was developed by the researchers and was administered to the  
125 clients by trained research assistants.

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## 127 **2.8 Outcome Measure**

128 The outcome measure of the study was clients true satisfaction with maternal health service also denoted  
129 as satisfaction index and was assessed by proportion of clients in the two study groups who were  
130 satisfied with antenatal, and postnatal care received at the health centers and were ready to use the  
131 same health centers again and also willing to recommend them to others for same services.

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## 134 **2.9 Conceptual Framework**

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Figure 1: Conceptual framework  
Source; Adapted using the Donabedian model of Quality of Care

151 The study adopted the “structures- processes- outcomes’ framework as suggested by Avedis Donabedian  
152 in 1981. Donabedian, utilized the three concepts in defining and assessing the quality of care [9,10]. The  
153 aspect of structure, comprises the human, material and organizational resources that are used to provide  
154 care. The process component refers to the set of activities that take place between the provider and the  
155 client. Specifically, the provider makes use of available structural elements to manage the technical and  
156 personal aspects of the health of the woman. The outcome component measures the consequences of  
157 these services on the clients. There are two elements of this concept of outcome, the direct impact of  
158 treatment on the current and future health of the woman or her newborn and the direct impact of  
159 treatment on her satisfaction with services offered and on her health seeking behaviour.

160  
161 The outcome indicator that was used in this study was the satisfaction of the women with the services  
162 **received**. Even though this indicator is influenced by ~~womens’~~ women’s expectation and their previous  
163 experiences, it **was** considered adequate for use as **it has been** noted that changes in quality of care  
164 rendered can be detected in the woman long before the physical changes in the health status can be  
165 **seen [28]**. There is also the assumption that a satisfied woman would benefit more from the care provided  
166 than one who is not satisfied. The three levels do follow a logical sequence, available resources put into  
167 action by the providers of healthcare, lead to activities that produce results. The socio-demographic  
168 characteristics of the woman however remain a very important background factor in determining how  
169 satisfied the woman will be with the services she has received.

## 170 171 **2.10 Data Analysis**

172 Data analysis was done using Statistical Package for Social Sciences, (SPSS) statistical software version  
173 20. Frequency tables and cross tabulations were generated and level of significance was determined by a  
174 p-value of less than 0.05. The socio-demographic characteristics of clients, activities and procedures  
175 performed for clients during antenatal and postnatal care and clients’ perception of these services in  
176 urban and rural primary health centers were compared. Also clients’ true satisfaction with maternal health  
177 service was compared. Multivariate analysis using binary logistic regression was used to determine the  
178 factors predictive of clients’ true satisfaction with maternal health service. Variables that had a p-value of  
179 less than 0.2 in bivariate analysis were entered into the logistic regression model to determine the



180 | predictors of clients' true satisfaction with maternal health service. A logistic regression model was fitted  
181 | for both the urban and rural areas and results were reported using Adjusted Odds Ratio, (AOR) and 95%  
182 | Confidence Intervals (CI).

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184 | In assessing the personnel and equipment **available** in the health centers, the minimum standards for  
185 | primary health care services in Nigeria by the NPHCDA ~~was-were~~ used. A score of zero was recorded  
186 | when the item in the list was not available or personnel ~~were~~ not in the employment of health center, a  
187 | score of one was recorded if the item was present but not functioning or not in use, or it was incomplete in  
188 | number and a score of two **was assigned if the item was seen, the number was adequate** and ~~it was~~ also  
189 | functional. For individual health facilities, a score of fifty percent and above **of total score** was considered  
190 | adequate while any score that was less than fifty percent was considered inadequate. For comparison,  
191 | the mean **score** of health centers for equipment and health manpower in urban and rural **areas was**  
192 | compared using the Student t test.

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194 | The process aspect was assessed using a client-provider interaction checklist for antenatal care as  
195 | adopted from the NPHCDA guideline. The scoring system used was as indicated in the guideline. For  
196 | individual health facilities, a score of fifty percent and above of total **score** was considered adequate while  
197 | any score that was less than fifty percent was inadequate. For comparison, the mean **score** of health  
198 | centers for facility quality assessment schedule in urban and rural **areas was** compared using the Student  
199 | t test.

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### 201 | **3. RESULTS**

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203 | Table 1 shows the socio-demographic characteristics of clients of maternal health service. The mean age  
204 | of clients in urban **area** was significantly higher than that in rural. ~~The M~~majority of clients in the two study  
205 | groups were in ~~the~~ age group 25-29 years. Also, ~~the~~ majority of clients in the two study groups were  
206 | married and had secondary education.

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**Table 1: Socio-demographic characteristics of clients of maternal health service**

<b>Variable</b>	<b>Urban (n=270) N (%)</b>	<b>Rural (n=270) N (%)</b>	$\chi^2$	<b>p value</b>
<b>Age of clients</b>				
Mean $\pm$ SD (years)	27.9 $\pm$ 5.5	26.9 $\pm$ 5.7	2.032 <sup>a</sup>	0.043
<b>Age groups in years</b>				
< 20	19 (7.0)	21 (7.8)	6.588	0.159
20 – 24	58 (21.5)	73 (27.0)		
25 – 29	82 (30.4)	91 (33.7)		
30 – 34	80 (29.6)	56 (20.7)		
$\geq$ 35	31 (11.5)	29 (10.7)		
<b>No of living children</b>				
1 child	94 (34.8)	99 (36.7)	0.250	0.882
2 – 4 children	153 (56.7)	150 (55.6)		
$\geq$ 5 children	23 (8.5)	21 (7.8)		
<b>Marital status</b>				
Never married	21 (7.8)	29 (10.7)	1.411	0.235
Married	249 (92.2)	241 (89.3)		
<b>Religion</b>				
Christianity	259 (95.9)	249 (92.2)	4.325	0.113
Traditional religion	4 (1.5)	4 (1.5)		
Islam	7 (2.6)	17 (6.3)		

<b>Ethnic group</b>			
Igbo	263 (97.4)	253 (93.7)	4.638 0.098
Hausa	5 (1.9)	10 (3.7)	
Yoruba	2 (0.7)	7 (2.6)	
<b>Education (Respondents)</b>			
No formal education	11 (4.1)	11 (4.1)	35.883 <0.001
Primary education	11 (4.1)	35 (13.0)	
Secondary education	208 (77.0)	217 (80.4)	
Post secondary education	40 (14.8)	7 (2.6)	
<b>Education (Husband)</b>			
No formal education	18 (7.2)	35 (14.5)	40.118 < 0.001
Primary education	14 (5.6)	20 (8.3)	
Secondary education	162 (65.1)	177 (73.4)	
Post secondary education	55 (22.1)	9 (3.7)	
<b>Occupation (Respondents)</b>			
Housewife/unemployed	148 (54.8)	198 (73.3)	30.359 <0.001
Self employed	76 (28.1)	61 (22.6)	
Salaried employment	46 (17.0)	11 (4.1)	
<b>Occupation (Husband)</b>			
Self employed	124 (49.8)	158 (65.6)	18.096 <sup>b</sup> <0.001
Salaried employment	125 (50.2)	80 (33.2)	
Unemployed	0 (0.0)	3 (1.2)	

<b>Socio-economic status</b>			
Poorest	43 (15.9)	93 (34.4)	76.303 <0.001
Very poor	58 (21.5)	83 (30.7)	
The poor	77 (28.5)	78 (28.9)	
Least poor	92 (34.1)	16 (5.9)	

210 <sup>a</sup>Student t test

211 <sup>b</sup> Licklehood Ratio

212

213 Table 2 shows activities and procedures carried out for clients during antenatal and postnatal care. The  
 214 mMajority of clients in the two study groups (urban, 72.2%; rural 72.6%) registered themselves for  
 215 antenatal care in second trimester. A minor proportion of clients, 7% in urban and 24.1% in rural areas  
 216 delivered in the same primary health centers that they obtained antenatal and postnatal care. The  
 217 Mmajority of clients in the two study groups received information on breast feeding, immunization, family  
 218 planning and care of baby during postnatal visits.

219

220 **Table 2: Activities and procedures carried out during antenatal and postnatal care**

Variable	Urban (n=270) N (%)	Rural (n=270) N (%)	$\chi^2$	p value
<b>When clients booked for antenatal care</b>				
First trimester	69 (25.6)	55 (20.4)	8.343	0.015
Second trimester	195 (72.2)	196 (72.6)		
Third trimester	6 (2.2)	19 (7.0)		
<b>Procedures performed at</b>				

<b>antenatal care</b>				
Weighing	254 (94.1)	258 (95.6)	0.603	0.438
Blood pressure check	256 (94.8)	251 (93.0)	0.807	0.369
Blood test	255 (94.4)	241 (89.3)	4.850	0.028
Urine test	255 (94.4)	255 (94.4)	FT	1.00
<b>Choice of health center for antenatal care</b>				
Proximity to health center	126 (46.7)	122 (45.2)	7.615	0.022
Health worker related factors <sup>a</sup>	92 (34.1)	71 (26.3)		
Free medical service	52 (19.3)	77 (28.5)		
<b>Client delivered in <u>the</u> same primary health centers</b>				
Yes	19 (7.0)	65 (24.1)	29.831	<0.001
No	251 (93.0)	205 (75.9)		
<b>Timing of postnatal care after delivery.</b>				
1-3 days	76 (28.1)	31 (11.5)	29.540	<0.001
6 days	53 (19.6)	92 (34.1)		
≥ 10 days	141 (52.2)	147 (54.4)		
<b>Information given during postnatal visit</b>				
Breast feeding	265 (98.1)	260 (96.3)	1.714	0.190
Immunization	266 (98.5)	262 (97.0)	1.364	0.243

Family planning	262 (97.0)	257 (95.2)	1.239	0.266
Care of baby	265 (98.1)	263 (97.4)	0.341	0.559
<b>Procedures performed during postnatal visit</b>				
Abdominal examination	249 (92.2)	258 (95.6)	2.614	0.106
Vaginal examination	170 (63.0)	202 (74.8)	8.848	0.003
Blood pressure check	188 (69.6)	230 (85.6)	18.679	<0.001
Examination of baby	266 (98.5)	255 (94.4)	6.601	0.010
<b>Choice of health center for postnatal care</b>				
Immunization services	187 (69.3)	182 (67.4)	17.516	0.001
Health worker related factors <sup>a</sup>	50 (18.5)	31 (11.5)		
Proximity to health centers	22 (8.1)	51 (18.9)		
Free medical service	11 (4.1)	6 (2.2)		

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222 <sup>a</sup>competence, friendless, good service, and previous experience with the health worker

223 **FT Fishers exact test**

224

225 Table 3 shows clients perception of quality of maternal health care in primary health centers. A

226 significantly higher proportion of clients in rural area (86.3%) were satisfied with maternal health service

227 when compared with clients in urban (77%). Also, a significantly higher proportion of clients in rural,

228 (75.6%) were truly satisfied with maternal health service when compared with clients in urban (64.8%).

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233 **Table 3: Clients perception of quality of maternal health care**

<b>Variable</b>	<b>Urban (n=270) N (%)</b>	<b>Rural (n=270) N (%)</b>	$\chi^2$	<b>p value</b>
<b>Satisfaction with maternal health service</b>				
Satisfied	208 (77.0)	233 (86.3)	7.730	0.005
Not satisfied	62 (23.0)	37 (13.7)		
<b>Will use health center again for maternal health care</b>				
Yes	227 (84.1)	249 (92.2)	8.579	0.003
No	43 (15.9)	21 (7.8)		
<b>Reason to use health center again</b>	<b>(n= 227) N (%)</b>	<b>(n= 249) N (%)</b>		
Proximity to health center	94 (41.4)	111(44.4)	24.038	<0.001
Free medical service	57 (25.1)	100 (40.0)		
Health worker related factors <sup>a</sup>	76 (33.5)	39 (15.6)		
<b>Will recommend health center to others for maternal health care</b>	<b>( n=270) N (%)</b>	<b>( n=270) N (%)</b>		
Yes	232 (85.9)	239 (88.5)	0.814	0.367
No	38 (14.1)	31 (11.5)		
<b>Reason to recommend</b>	<b>( n=232)</b>	<b>(n=239)</b>		

<b>health center to others</b>	<b>N (%)</b>	<b>N (%)</b>	
Health worker related factors <sup>a</sup>	94 (40.5)	52 (21.8)	20.773 <0.001
Free medical service	66 (28.4)	102 (42.7)	
Proximity to health center	72 (31.0)	85 (35.6)	
<b>True satisfaction with maternal health service (Satisfaction index)</b>	<b>( n=270) N (%)</b>	<b>( n=270) N (%)</b>	
True satisfaction	175 (64.8)	204 (75.6)	7.443 0.006
Not satisfied	95 (35.2)	66 (24.4)	

234 <sup>a</sup>competence, friendless, good service, and previous experience with the health worker

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236 Table 4 shows factors associated with clients' true satisfaction with maternal health service (satisfaction  
 237 index). Clients in urban area were about twice less likely to be truly satisfied with maternal health service  
 238 when compared with clients in rural. Also, clients who were not married were about four times less likely  
 239 to be truly satisfied with maternal health service when compared with those who were married. The clients  
 240 who were unemployed were twice more likely to be truly satisfied with maternal health service when  
 241 compared with those who were on salaried employment.

242

243 Table 4: Factors associated with true satisfaction with maternal health service

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<b>Variable</b>	<b>True satisfaction with maternal health service</b>		<sup>a</sup> p value	<sup>b</sup> AOR, (95%CI)
	<b>n=540</b>			
	<b>Yes</b>	<b>No</b>		
	<b>N (%)</b>	<b>N (%)</b>		
<b>Location</b>				
Urban	175 (64.8)	95 (35.2)	0.006	0.4- 0.9



Rural	204 (75.6)	66 (24.4)		
<b>Age groups in years</b>				
< 30 years	237 (68.9)	107 (31.1)	0.385	NA
≥ 30 years	42 (72.4)	54 (27.6)		
<b>No of living children</b>				
1-2 children	236 (69.2)	105 (30.8)	0.516	NA
>2 children	143 (71.9)	56 (28.1)		
<b>Marital status</b>				
Never married	23 (46.0)	27 (54.0)	<0.001	0.1- 0.5
Married	356 (72.7)	134 (27.3)		
<b>Religion</b>				
Christianity	357 (70.3)	151 (29.7)	0.855	NA
Others <sup>c</sup>	22 (68.8)	10 (31.3)		
<b>Ethnic group</b>				
Igbo	360 (69.8)	156 (30.2)	0.325	NA
Others <sup>d</sup>	19 (79.2)	5 (20.8)		
<b>Education (Respondents)</b>				
Primary education and less	48 (70.6)	20 (29.4)	0.938	NA
Secondary education and more	331 (70.1)	141 (29.9)		

<b>Education (Husband)</b>				
Primary education and less	66 (75.9)	21 (24.1)	0.459	NA
Secondary education and more	290 (72.0)	113 (28.0)		
<b>Occupation (Respondents)</b>				
Housewife/unemployed	260 (75.1)	86 (24.9)	0.001	1.3- 4.5
Self employed	89 (65.0)	48 (35.0)		0.7- 2.6
Salaried employment	30 (52.6)	27 (47.4)		
<b>Occupation (Husband)</b>				
Self employed	212 (75.2)	70 (24.8)	0.151	NA
Salaried employment	143 (69.8)	62 (30.2)		
Unemployed	1 (33.3)	2 (66.7)		
<b>Socio-economic status</b>				
Low socio-economic status	198 (71.5)	79 (28.5)	0.500	NA
High socio-economic status	181 (68.8)	82 (31.2)		

245 <sup>a</sup> P-value on bivariate analysis, <sup>b</sup> Adjusted odds ratio (95% confidence interval)

246 <sup>c</sup> Hausa, Yoruba <sup>d</sup> Traditional religion, Islam

247

248 Table 5a shows the checklist for essential equipment in primary health centers. The mean essential  
 249 equipment score in the rural area was higher than that in the urban but the difference in the means was  
 250 not found to be statistically significant. None of the primary health centers in urban and rural areas had  
 251 adequate equipment.

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255 **Table 5a: Checklist for essential equipment in primary health centers**

Variable	Urban n=9	Rural n=9	Student t test	P value
Essential equipment list				
Mean (SD)	51.4±36.3	73.6±21.2	1.571	0.140
	<b>N (%)</b>	<b>N (%)</b>	<b>Total (%)</b>	
Facilities that scored ≥50% of total score in essential equipment list	0 (0)	0 (0)	0 (0)	

256  
 257 Table 5b shows the checklist for minimum health manpower for primary health centers. There was no  
 258 statistical significant difference in the mean score for health manpower available in urban and rural areas.  
 259 Three health centers in urban area had adequate health manpower.

260  
 261 **Table 5b: Checklist for minimum health manpower for primary health centers.**

Variable	Urban n=9	Rural n=9	Student t test	P value
Health manpower available				
Mean (SD)	6.7±3.8	6.1±0.9	0.425	0.681
	<b>N (%)</b>	<b>N (%)</b>	<b>Total (%)</b>	
Facilities that scored ≥50% of total score for health manpower	3 (33.3)	0 (0)	3 (16.7)	

262  
 263 Table 5c shows the checklist for facility quality assessment in primary health centers. The mean facility  
 264 quality assessment scores in urban and rural areas was/were comparable and only one health center in  
 265 rural area had adequate client provider interaction.

266

267 **Table 5c: Checklist for facility quality assessment (Client –provider interaction)**

268

Variable	Urban n=3	Rural n=3	Student t test	P value
Facility quality assessment				
Mean (SD)	75.2±7.9	86.8±25.5	0.759	0.490
	<b>N (%)</b>	<b>N (%)</b>	<b>Total (%)</b>	
Facilities that scored ≥50% of total score in facility quality assessment	0 (0)	1 (33.3)	1 (16.7)	

269

270

#### 271 **4. DISCUSSION**

272

273 From results of this study, none of the primary health centers in the study area had adequate equipment  
 274 for provision of maternal health service. This could be a pointer to the neglect of primary health centers in  
 275 Nigeria over a period of years. This is because similar results were obtained in 2001, when NPHCDA  
 276 surveyed 676 primary health care facilities, and 5.6% of the health centers did not have any of the 26  
 277 essential equipments listed as minimum equipment package for use in a generic primary health care  
 278 facility [29]. A study in southwest Nigeria, revealed that 44.4% of health centers lacked basic equipment  
 279 for the provision of services [30]. Also, in southwest Nigeria another study revealed a great lack in  
 280 equipment and supplies needed for provision of emergency obstetric care in rural Local Government  
 281 Areas resulting in absence of these services in these areas [14].

282

283 Only three health centres (16.7%), all in the urban area had adequate manpower for provision of maternal  
 284 health service. In a study in 2003 on quality of care in Nigeria, only 18.5% of 1500 primary health care  
 285 facilities surveyed had the capacity to provide emergency obstetric care [13]. Similarly, a case study on  
 286 Local Government Areas and healthcare delivery in Nigeria identified shortage of qualified health workers

287 as one of the factors that limit the implementation of Primary Health Care [31]. Also, in an assessment of  
288 healthcare facilities in Nigeria for the availability and use of obstetric care, 60% of primary health centers  
289 lacked essential clinical staff needed for provision of basic emergency obstetric care services [32].  
290 Furthermore, a World Bank assessment of primary health care that included private and public facilities in  
291 four states in Nigeria, showed that most of the facilities did not have the personnel and equipment needed  
292 to offer services effectively. The study concluded that the state of infrastructure in public primary health  
293 facilities was generally poor [33]. Only one health centre, (16.7%), in the rural area had adequate client  
294 provider interaction during antenatal care.

295  
296 The proportion of clients that had urine and blood tests during antenatal care in urban and rural areas  
297 was higher than those that had similar procedures in the National Demographic and Health Survey  
298 (NDHS) [4]. This difference in proportions could be explained by the fact that this was a facility based  
299 study as opposed to the NDHS which was community based. However, it could also be a reflection of the  
300 good work attitude of providers of healthcare in primary health centers in the study area. The major  
301 reason clients preferred the health centers for antenatal care in the two study groups was nearness of  
302 health centers to their homes, (urban: 46.7%; rural: 46.2%). This is similar to a finding from a study in  
303 Lagos, Nigeria, where the majority utilized primary health centers for antenatal care based on proximity to  
304 their homes [34], and this is in line with the principles of Primary Health Care system [1].

305  
306 Among the 540 respondents included in this study, only a minor proportion (urban 7.0%; rural 24.1%),  
307 delivered in the health centers. This reveals that utilization of primary health centers for delivery services  
308 is poor in urban and rural areas. From the results of the NDHS, the major place of delivery in both urban  
309 and rural areas in Nigeria is the home [4]. This has led to the conclusion that the use of health services in  
310 Nigeria for delivery services is poor [35], and on the part of Primary Health Care system, this could be  
311 attributed to inadequate service delivery [36], as most of these health centers do not offer round the clock  
312 services [37].

313  
314 The higher proportion of deliveries in rural health centres may be because in most rural communities in  
315 Nigeria, primary health centers are the predominant health facilities and may in some instances be the

316 only option for health facility delivery. It could be assumed that this tendency for home deliveries may be  
317 the major factor contributing to **the** high maternal mortality ratio in Nigeria. With the burden being more in  
318 rural area, a good focus on the Primary Health Care system with strong emphasis on quality of care may  
319 help in improving maternal health. In line with this, there has been **a** suggestion for regular evaluation of  
320 quality in primary healthcare services based on the assumption that it will promote client oriented health  
321 services [15].

322  
323 The Mmajority of clients in the study area received information on breast feeding, immunization, family  
324 planning and care of baby during postnatal care. This could be explained by the fact that health education  
325 in form of health talks have become an essential part of service delivery in primary health centers in the  
326 study area and the various providers of healthcare are skilled in **the** delivery of this service [38], and this  
327 is commendable. On procedures performed during postnatal care, a reduced proportion of **the clients** in  
328 the two study groups had vaginal examination and blood pressure measurement when compared **with**  
329 **those that had their abdomen and babies examined**. This is because the various health centers do not  
330 have specified days for postnatal care but do have it combined with immunization services. This, to an  
331 extent, favours the mothers as it reduces the number of visits to the health centers.

332  
333 Considering the relatively high level of immunization coverage in southeast Nigeria when compared with  
334 other zones [4], and the reliance on primary health centers for delivery of such services [1], it could be  
335 explained that the health centers which in most cases do not have adequate staff strength [37], may not  
336 be able to perform such services as vaginal examination and blood pressure check for all the women that  
337 came for postnatal care. The combination of postnatal care with immunization services in the health  
338 centers could be explained by the fact that the majority of **the clients** (69.3% urban, 67.4% rural), chose  
339 the health centers for postnatal care because of immunization services. This synergy between postnatal  
340 care and immunization will be of assistance in revealing the relevance of postnatal care as it has been  
341 identified as the most neglected of the components of maternal health **service** [39].

342

343 A significantly higher proportion of clients in the rural area (86.3%), were satisfied with maternal health  
344 service when compared with clients in the urban area (77%). This result is closely related to that from

345 Anambra state, Nigeria, where 89.7% of respondents were satisfied with maternal healthcare service at  
346 primary health centers [40]. The major reason why clients in the urban area were willing to recommend  
347 the health centers to others were factors that were related to health workers which included their  
348 perceived technical competence, friendliness, good service and also previous good experience with their  
349 services. In the rural area, it was because of free medical service of the State Government which was in  
350 operation during the period of the study. In a study on clients satisfaction with immunization services, the  
351 same health worker related factors were the major reasons why clients wanted to use health centers  
352 again and also willing-had the will to recommend them to others for immunization services [41]. This  
353 could serve as a pass mark for the health workers and, bearing in mind the inadequacies in the structure  
354 and process components of quality of care as obtained in this study, the opinion of health workers in  
355 attributing societal and health system factors as constraints to delivery of quality maternal health service  
356 in primary health centers could be justified [37].

357  
358 In the urban area, 64.8% of clients were truly satisfied with maternal health service while 75.6% in the  
359 rural area were also truly satisfied. Bearing in mind the deficiencies of structure and process components  
360 of quality of care it could be that clients of maternal health service focus more on providers of healthcare  
361 and their interactions with them than on the health system and its deficiencies, hence they were easily  
362 satisfied with the services received. This places the responsibility of ensuring good utilization of services  
363 at primary health centers and the satisfaction of clients with services received on the providers of  
364 healthcare in these facilities. Generally, it has been noted that pregnant women in developing countries  
365 are uncritical of healthcare services they receive preferring to accept whatever care that are is rendered  
366 during this period as being appropriate [42].

367  
368 From the results of this study, the clients in the urban area were about twice less likely to be truly satisfied  
369 with maternal health service when compared with those in the rural area. In most rural areas in Nigeria,  
370 the health centers are the prominent health facilities. This may positively affect the perception of services  
371 from these centers by the women unlike the inhabitants of urban areas where there are alternatives for  
372 such service provision including private health facilities. Some studies have revealed that women

373 perceive quality care in private facilities to be better than that from public but are discouraged from using  
374 | them by reason of cost [43,44]. There maybe the tendency for clients in the urban **area** to feel  
375 | disadvantaged in using primary health centers for maternal health service hence less satisfied with  
376 | services received **when compared with their counterparts in the rural area.**

377  
378 Also clients who were unmarried were about four times less likely to be truly satisfied with maternal health  
379 service when compared with those who were married. This may be attributed to the positive influence and  
380 support from their spouses which may make them more prepared for pregnancy, delivery and child  
381 | rearing. Based on this, they may avail themselves of services in the health centers ~~hence~~ more satisfied  
382 | than clients who were unmarried. In a study in Anambra state, Nigeria, being married was significantly  
383 associated with overall satisfaction with maternal health services [40].

384  
385 Clients who were unemployed were twice more likely to be truly satisfied with maternal health service  
386 when compared with those who were on salaried employment. It could be that women who were  
387 housewives and unemployed were less distracted and paid more attention to their pregnancies and  
388 expected babies and so derived more pleasure with antenatal and postnatal care services hence more  
389 satisfied than those who were employed.

390

## 391 **5. CONCLUSION**

392  
393 The structure and process components of quality of maternal health service in primary health centers in  
394 | the study area were deficient. Also, utilization of health centers for delivery services **was** poor. The clients  
395 | of maternal health service seem to focus more on providers of healthcare and their interactions with them  
396 | than the health system and its deficiencies hence **were** easily satisfied with services received. To reduce  
397 | the maternal death burden in Nigeria there is the need for adequate attention on rural areas, the primary  
398 | health care system and the provision of client oriented health services at all levels of care. More health  
399 workers should be employed, and more equipment supplied in-order to improve the quality of maternal  
400 health service in the primary health centers.



401  
402 **ETHICAL APPROVAL**

403  
404 Ethical approval for the study was obtained from Health Research and Ethics Committee of University of  
405 Nigeria Teaching Hospital Ituku-Ozalla, Enugu. Clients were required to sign or thumbprint on written  
406 informed consent form before the interview and the nature of the study, its relevance and level of their  
407 participation were adequately explained to them. Participation in the study was voluntary and participants  
408 were assured that all information as would be provided in the questionnaire will be treated confidentially  
409 and anonymously. Also, no identifying information was obtained from the study participants

410  
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523  
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