Original Article

Spatial Differences in Knowledge and Perception of Key Danger Signs of Pregnancy among Mothers in Ebonyi State, Nigeria

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Abstract

Background: To determine knowledge and perception of key danger signs of pregnancy among mothers in urban and rural communities of Ebonyi state, Nigeria.

Methodology: A comparative cross-sectional study design was used. The two-stage sampling technique was used to select 660 women in four of thirteen local government areas in the state. The women have delivered in last one year irrespective of place of delivery. Outcome measure included good knowledge of danger signs and was assessed by proportion of respondents who recalled four of eight danger signs. Positive perception was assessed by proportion who were aware that danger signs of pregnancy were capable of causing death of women if unattended to immediately.

Results: The mean age of respondents was urban, 29.6±6.2 and rural, 28.6±5.1 years. The most recalled danger sign was bleeding before labour; urban, 280 (84.8%); rural,267 (80.9%). Comparable proportions - urban, 272 (82.4%); rural, 287 (87.0%) had good knowledge of danger signs. (p=0.105). Predictors of good knowledge of danger signs included residing in urban, (AOR=0.4; 95%C1:0.2-0.9), being <30 years, (AOR=0.6; 95%C1:0.3-0.9), having 2-4 children, (AOR=2.4; 95%C1:1.2-4.7) and not receiving antenatal care from a skilled provider. (AOR=0.2; 95%C1:0.08-0.4). There was an association between good knowledge and positive perception of danger signs. (p<0.001).

Conclusions: Majority of respondents in study area had good knowledge and positive perception of danger signs of pregnancy. Consolidating the understanding of danger signs will enhance maternal health outcome thus improving the maternal death burden in Nigeria. There is need to ensure that all women receive antenatal care from a skilled provider.

Keywords: Danger signs; Pregnancy; Knowledge and Perception; Ebonyi State; Nigeria.

Introduction

The sub-Saharan African region bears the highest burden of pregnancy complications. This is because about 66% of global maternal deaths occur in this region. [1] At the country level, maternal deaths are highest in Nigeria as the country accounts for about 19% of the total maternal deaths in the world. [1] The first target of the third Sustainable Development Goal (SDG) aims to reduce global maternal mortality to less than 70 deaths per 100, 000 live births by the year 2030. [2] Suffice it to say that for countries with high maternal mortality including Nigeria, this appears to be a tall order. [3] This is because the global maternal

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mortality ratio decreased by only 44% from 385 to 216 maternal deaths per 100,000 live births between 1990 and 2015. [1] It has been postulated that to realize this SDG goal especially in low income countries where the burden of maternal deaths is greatest, there is the need to improve the awareness and knowledge of the signs and symptoms of pregnancy complications. [4] Thus affirming the concept that increasing the knowledge of obstetric danger signs among women, their families and in the community is one of the strategies for reducing maternal deaths.

Danger signs of pregnancy are not the real obstetric complications but symptoms that are easily identified by non-medical personnel. The key danger signs of pregnancy signs are eight in number and includes amongst others bleeding before labour. [5] It has been found that raising awareness of pregnant women on key danger signs of pregnancy is of good effect in improving early detection of complications thus reducing the delay in deciding to seek obstetric care. [6] There is evidence that every pregnancy is faced with a measure of risk. [7] Also, for every maternal death that occurs between 15 and 30 women who survive childbirth suffer from short and long term disabilities. [8] Thus awareness and knowledge of danger signs of pregnancy have been identified as a step towards improving maternal health. [9]

It has been ascertained that the assessment of women's awareness of obstetric danger signs also contribute to increasing the awareness of these danger signs. [10] Also, increasing the knowledge of these danger signs among women has been identified as a way of strengthening primary health care. [11] Furthermore, studies have shown that women with knowledge of at least one danger sign of pregnancy were more likely to be birth prepared than others, [12,13] and this if sustained has the capacity of decreasing maternal morbidity and mortality in low income countries. This study was designed to determine the knowledge and perception of key danger signs of pregnancy among mothers in urban and rural communities of Ebonyi State, Nigeria.

Materials and Methods

Study setting

The study was conducted in Ebonyi State which is one of the five states in southeast geo-political zone of Nigeria. The inhabitants are mainly of Igbo ethnic nationality with mixture of other tribes and are predominantly Christians. Ebonyi State has 13 local government areas of which three are designated as urban while the remaining ten local government areas are classified as rural.

Study Design

This was a cross-sectional comparative study.

Study Population

The study population were mothers who have delivered babies within one year preceding the study, which was indicated by the first day of data collection irrespective of place of delivery. Also the women must be permanent residents of the selected communities for at least one year. Those that refused consent to participate in the study were excluded.

Sample Size Determination

The minimum sample size for the study was determined by the formula used to compare two independent proportions. [14] From a study in an urban community in Nigeria, 19.6% of the respondents knew at least four key danger signs during labour, [15] while from a rural community in Nigeria, 24.2%% had good knowledge of danger signs of pregnancy. [16] A total of 330 respondents were estimated for each study group based on type 1 error (α) of 0.05 in a two sided test with power of 0.8 and a design effect of 2.0.

Sampling Technique

A two stage (cluster) sampling technique was used to select the mothers for inclusion in the study. In the first stage, two local government areas each were selected from the three urban and ten rural local government areas of the state using a simple random sampling technique of balloting. In the second stage, two communities each were selected from a list of communities in the selected local government areas using a simple random sampling technique of balloting. In the selected communities, any woman that meets the inclusion criteria were consecutively recruited until the sample size was reached. The first respondent was selected by spinning a bottle in an agreed center of each of the selected communities and following the direction of the bottle the researchers moved from house to house.

Study Instrument

A pretested, semi-structured, interviewer administered questionnaire which was designed by the researchers was used to obtain information from the respondents.

Data Analysis

Data entry and analysis were done using Statistical Package for Social Sciences (SPSS) statistical

software version 22. Frequency distribution and cross tabulations were generated. Chi square test of statistical significance and multivariate analysis using binary logistic regression were used in the analysis and the level of statistical significance was determined by a p value of less than 0.05.

The outcome measures of the study were good knowledge and positive perception of danger signs of pregnancy. Good knowledge of danger signs was determined by proportion of respondents in either the urban or rural areas who recalled four or more of the eight key danger signs of pregnancy. Good perception of danger signs was determined by the proportion of respondents who perceived that danger signs of pregnancy was capable of causing the death of a pregnancy woman if not attended to on time.

Ethical approval

Ethical approval for the study was obtained from the Research and Ethics Committee of Ebonyi State University Abakaliki, southeast Nigeria. The respondents signed a written informed consent form before participating in the study. The participants were assured by the researchers that participation in the study was voluntary, and that information obtained for the study will treated anonymously and confidentially.

Results

Table 1 shows the socio-demographic characteristics of the respondents. The mean age of the respondents in the urban area, 29.6±6.2 years was significantly higher than that of the rural, 28.6±5.1 years, (Student t=2.691, p=0.007). Majority of respondents in urban area, 53.6% have attained tertiary education while in the rural, majority, 61.2% have attained secondary education and the difference in proportions of the respondents on educational attainment was found to be statistically significant, (χ^2=208.961, p<0.001).

Table 2 shows the knowledge of danger signs of pregnancy among the respondents. Comparable proportions of respondents in urban, 88.8% and rural area, 92.7% were informed about danger signs of pregnancy during antenatal care, (χ^2=3.053, p=0.081). Also, comparable proportions of respondents in urban, 84.8% and rural, 80.9% recalled vaginal bleeding before labour, (χ^2=1.805, p=0.179). A significantly higher proportion of respondents in rural area, 82.1%) recalled swollen hands and feet when compared with those in the urban, 68.2%, (χ^2=17.169, p<0.001).

Table 3 shows good knowledge and positive perception of danger signs of pregnancy among the respondents. Comparable proportions of respondents in rural area, 87.0% and those in the urban, 82.4% had good knowledge of danger signs of pregnancy, (χ^2=2.630, p=0.105). A significantly higher proportion of respondents in the rural area, 85.5% had positive perception of danger signs when compared with those in the urban 76.4%, (χ^2=8,828, p=0.003).

Table 4 shows the factors affecting good knowledge of danger signs of pregnancy among the respondents. The respondents who reside in urban area were about three times less likely to have good knowledge of danger signs of pregnancy when compared with those in the rural. (AOR=0.4, 95% CI: 0.2-0.9). The respondents who were less than 30 years were about two times less likely to have good knowledge of danger signs when compared with those who were 30 years and above, (AOR=0.6, 95%CI:0.3-0.9). The respondents who had 2-4 children were twice more likely to have good knowledge of danger signs when compared with those who had five children and more, (AOR=2.4, 95%CI: 1.2-4.7). The respondents who attended antenatal care with a traditional birth attendant or at home were five times less likely to have good knowledge of danger signs when compared with those who attended antenatal care in a private or mission hospital, (AOR=0.2, 95%C1: 0.1-0.4).

Table 5 shows the relationship between good knowledge and positive perception of danger signs. A significantly higher proportion of respondents who had good knowledge of danger signs, 86.2% had positive perception of danger signs when compared with those who had poor knowledge, 51.5%, (χ^2=66.839, p<0.001).

Table 1: Socio-demographic characteristics of respondents

Variable	Urban (n=330) N (%)	Rural (n=330) N (%)	χ^2	p value
Age of respondents (years)				
Mean±(SD)	29.6±6.2	28.6±5.1	2.691*	0.007
Age of respondents in groups				
<25 years	59 (17.9)	64 (19.4)	3.334	0.343
25-29 years	109 (33,0)	127 (38.5)		
30-34 years	99 (30.0)	85 (25.8)		
–	63 (19.1)	54 (16.4)		
Number of children				
One child	59 (17.9)	89 (27.0)	18.152	<0.001
2-4 children	232 (70.3)	179 (54.2)		
⩾5 children	39 (11.8)	62 (18.8)		

Marital status				
Never married	18 (5.5)	30 (9.1)	3.990	0.136
Married	310 (93.9)	296 (89.7)		
Separated/divorced	2 (0.6)	4 (1.2)		
Socio-economic status				
Low socio-economic class	93 (28.2)	237 (71.8)	127.673	<0.001
High socio-economic class	237 (71.8)	93 (28.2)		
Educational attainment of respondent				
No formal education	4 (1.2)	8 (2.4)	208.961	<0.001
Primary education	12 (3.6)	100 (30.3)		
Secondary education	137 (41.5)	202 (61.2)		
Tertiary education	177 (53.6)	20 (6.1)		
Employment status of respondent				
Unemployed	69 (20.9)	57 (17.3)	98.143	<0.001
Self-employed	129 (39.1)	242 (73.3)		
Salaried employment	132 (40.0)	31 (9.4)		

*Student t test

Table 2: Knowledge of danger signs of pregnancy

Variable	Urban (n=330) N (%)	Rural (n=330) N (%)	χ^2	p value
Health talks were given during pregnancy				
Yes	309 (93.6)	311 (94.2)	0.106	0.744
No	21 (6.4)	19 (5.8)		
Informed about danger signs of pregnancy				
Yes	293 (88.8)	306 (92.7)	3.053	0.081
No	17 (11.2)	24 (7.3)		
Danger signs recall**				
Vaginal bleeding before labour	280 (84.8)	267 (80.9)	1.805	0.179
Malpresentation	260 (78.8)	276 (83.6)	2.542	0.111
Unduly long labour	240 (72.7)	262 (79.4)	4.027	0.045
Heavy bleeding during or after labour	230 (69.7)	259 (78.5)	6.638	0.010
Swollen hands and feet	225 (68.2)	271 (82.1)	17.169	<0.001
Severe headache and fits	208 (63.0)	244 (73.9)	9.098	0.003
Fever	207 (62.7)	180 (54.5)	4.554	0.033
Smelly vaginal discharge	196 (59.4)	248 (75.2)	18.609	<0.001
Recalled one danger sign	320 (97.0)	314 (95.2)	1.441	0.230
Recalled two or more danger signs	314 (95.2)	309 (93.6)	0.716	0.398

**Multiple responses encouraged

Table 3: Good knowledge and perception of danger signs of pregnancy

Variable	Urban (n=330) N (%)	Rural (n=330) N (%)	χ^2	p value
Knowledge of danger signs				
Good	272 (82.4)	287 (87.0)	2.630	0.105
Poor	58 (17.6)	43 (13.0)		
Perception of danger signs				
Positive	252 (76.4)	282 (85.5)	8.828	0.003
Negative	78 (23.6)	48 (14.5)		

Table 4: Factors affecting good knowledge of danger signs of pregnancy

Variable	Knowledge of danger signs (n=660) Good N (%)	Poor N (%)	**P value	AOR(95%CI)***
Location				
Urban	272 (82.4)	58 (17.6)	0.105	0.4 (0.2-0.9)
Rural	287 (87.0)	43 (13.0)		1
Age of respondents				
<30 years	288 (80.2)	71 (19.8)	<0.001	0.6 (0.3- 0.9)
⩾ 30 years	271 (90.0)	30 (10.0)		1
Number of children				
One child	114 (77.0)	34 (23.0)	0.003	2.0 (0.9- 4.7)
2-4 children	363 (88.3)	48 (11.7)		2.4 (1.2- 4.7)
⩾5 children	82 (81.2)	19 (18.8)		1
Marital status				
Single*	33 (61.1)	21 (38.9)	<0.001	0.5 (0.2- 1.2)
Married	526 (86.8)	80 (13.2)		1
Employment status of respondent				
Unemployed	91 (72.2)	35 (27.8)	<0.001	0.7 (0.3- 1.6)
Self-employment	322 (86.8)	49 (13.2)		1.4 (0.7- 2.9)
Salaried employment	146 (89.6)	17 (10.4)		1
Employment status of husband				
Unemployed	8 (80.0)	2 (20.0)	0.585	NA
Self-employment	341 (86.1)	55 (13.9)		
Salaried employment	177 (88.5)	23 (11.5)		
Educational attainment of respondent				
Tertiary education	180 (91.4)	17 (8.6)	0.002	2.0 (0.9- 4.2)
Others^	379 (81.9)	84 (19.1)		1
Educational attainment of husband				
Tertiary education	202 (89.4)	24 (10.6)	0.148	NA
Others^	334 (85.3)	56 (14.7)		
Socio-economic status				
Low socio-economic class	267 (80.9)	63 (19.1)	0.007	0.7 (0.4- 1.3)
High socio-economic class	292 (88.5)	38 (11.5)		1
Place respondent attended antenatal care				
Home/Traditional birth attendant	21 (42.0)	29 (58.0)	<0.001	0.2 (0.1- 0.4)
Primary healthcare	241 (88.9)	30 (11.1)		1.2 (0.5- 2.9)
Secondary healthcare level	23 (88.5)	3 (11.5)		0.7 (0.2- 3.4)
Tertiary healthcare level	167 (90.3)	18 (9.7)		1.4 (0.7- 2.9)
Private/Mission hospital	107 (83.6)	21 (15.3)		1

*Never married, separated/divorced; **p value on bivariate analysis, NA Not applicable
***Adjusted odds ratio, 95% Confidence interval on multivariate analysis ^Secondary education and less

Table 5: Association between knowledge and perception of danger signs

Variable	Perception of danger signs (n=660) Good N (%)	Poor N (%)	χ^2	p value
Knowledge of danger signs				
Good	482 (86.2)	77 (13.8)	66.839	<0.001
Poor	52 (51.5)	49 (48.5)		

Discussion

Majority of respondents in urban, 88.8% and rural areas, 92.7% were informed of the danger signs of pregnancy during the pregnancy period. From the results of Nigeria Demographic and Health Survey, a higher proportion of women in urban area, 75.5% received information on signs of pregnancy complications when compared with those residing in rural area, 59.2%. [17] From the results of that survey also, majority of the women in Ebonyi state, 64.1% also received information on signs of pregnancy complications. [17] In a study among women who received antenatal care in primary health centers in southeast Nigeria, 85.9% of the respondents in urban area and 88.1% in rural also received information on the danger signs of pregnancy. [9] This may be an indication that in Nigeria, information on danger signs of pregnancy is part of routine antenatal care service delivery.

The most recalled danger sign among the respondents in the two study groups was vaginal bleeding before labor, (urban, 84.8% and rural, 80.9%). Bleeding per vagina has consistently remained the most recalled danger sign by women. In a study among women of reproductive age in rural communities of Enugu state, bleeding before labour was the most recalled danger sign [16]. Similar result was also obtained among women who attended antenatal care in the three levels of health care delivery in Nigeria. These included women who utilized primary health centers in urban and rural areas of southeast Nigeria [9] and secondary and tertiary health facilities in southwest Nigeria. [18,19] Similar results were also obtained from other parts of the African continent. [20,21,22,23]

Comparable proportions of respondents in urban (82.4%), and rural, (87.0%) areas had good knowledge of key danger signs of pregnancy. This is an indication of a high level of understanding of danger signs of pregnancy among mothers in the study area. It has been observed that fear of complications occasioned by the understanding of danger signs of pregnancy by mothers necessitated that women in rural areas of Ebonyi state, Nigeria register for antenatal care in more than one health facility. [24] This was because the women were not sure of the ability of health workers in the primary health centers which are the predominant health facilities in the rural area to handle these emergencies should they occur. [24] Studies from other regions of Nigeria also revealed that majority of respondents had good knowledge of danger signs of pregnancy. [9,18,19, 25] These results are at variance with that obtained from a study in rural communities of Enugu state, southeast Nigeria where only a minor proportion of respondents, 14.2% had good knowledge of danger signs of pregnancy. [16] This may be because the study in those rural communities involved women of reproductive age and not mothers. In Nigeria, health education is an integral part of antenatal care service delivery and this includes counselling on danger signs of pregnancy. [17] This may have accounted for the differences in the result of this study that involved women of reproductive age group and those that have previously attended antenatal care. In a study in Nepal, majority of respondents, 66% had adequate knowledge of obstetric danger signs. [26] However, in similar studies in urban Tanzania [23] and Somali region of Ethiopia [20] only minor proportions of respondents had good knowledge of danger signs. Suffice it to say that both studies concluded on the need for intervention efforts aimed at improving the knowledge of danger signs among the women.

From the results of this study when compared with respondents in urban area, residing in the rural area increased the probability of having good knowledge of danger signs of pregnancy. There is evidence that the burden of maternal mortality is higher in the rural area than the urban. [17] Also, the primary health centers which are less equipped both in personnel and equipment than the other levels of care are the main health facilities in the rural hence the providers of healthcare in primary health centers may have placed priority on knowledge of danger signs among the women attending antenatal care. Similar results were obtained among women who utilized primary health centers for antenatal care in Enugu state, southeast Nigeria [9] and in Tigray Region of Ethiopia. [27] Studies in other regions of Ethiopia [20,28] however, revealed that urban residents were more likely to have good knowledge of danger signs of pregnancy.

The respondents who were less than 30 years were about twice less likely to have good knowledge of danger signs when compared with those who were 30 years and above thus signifying that respondents in the older age group were more likely to have good knowledge of danger signs. This result is in agreement with that obtained among women in urban Tanzania. [23] It however varies with that obtained among women that utilized antenatal care in primary health centers of Enugu state, southeast Nigeria. [9]

The respondents in the study area who had 2-4 children were twice more likely to have good

knowledge of danger signs when compared with those who had five children and more. This signifies that with increasing parity, the women rely more on their experience in child bearing which is not the same for women of less parity. Thus, women of less parity may exercise more caution than those of higher parity hence their better understanding of the danger signs of pregnancy. This result is at variance with that obtained in the Somali region of Ethiopia where women who were pregnant on five or more occasions were six times more likely to have good knowledge of danger signs of pregnancy. [20]

The respondents who attended antenatal care with a traditional birth attendant or at home were five times less likely to have good knowledge of danger signs when compared with those who attended antenatal care in a private or mission hospital. It has been identified that health education is an important aspect of antenatal care service delivery and the contents of such education includes information of the danger signs of pregnancy. [17] This necessitates the need for women to receive antenatal care from a skilled provider. From studies in Ethiopia, it was found that women who attended antenatal care from a skilled provider were more likely to have good knowledge of danger signs when compared to those who did not. [20,21,29] Similarly, women who delivered in health institutions were more likely to have good knowledge of danger signs when compared with those who delivered at home. [27,30] This emphasizes the relevance of skilled providers in care of pregnant women in developing countries where the burden of maternal mortality is high.

A significantly higher proportion of respondents in the rural area had positive perception of danger signs of pregnancy when compared with those in the urban. In a study in Zambia, majority of the respondents also had good perception of danger signs of pregnancy. [31] Emphasis on positive perception of danger signs of pregnancy is important as it has been identified that some women are of the opinion that danger signs of pregnancy are caused by witchcraft and based on that they prefer to receive treatment first from traditional healers. [32] Thus there was a call for the involvement of traditional birth attendants and traditional healers in health education concerning the danger signs since they have a role to play in ensuring that women with such signs are referred to formal health facilities for appropriate care. [32]

Furthermore, it has been revealed that increasing the knowledge of obstetric danger signs among women is necessary but not sufficient to overcome cultural preferences for traditional treatments for pregnancy danger signs. [33] For example, it has been found that community perception of bleeding is at variance with the views of health professionals hence the understanding of the concept of bleeding during pregnancy depends on who is involved in the community. [34] This may likely increase the maternal death burden. From the results of this study, a significantly higher proportion of respondents who had good knowledge of danger signs had positive perception of danger signs when compared with those who had poor knowledge. Thus, there is the need to emphasize that the danger signs of pregnancy are capable of causing the death of the woman and as such there is the need to seek early and appropriate care as this is capable of improving the maternal death burden in developing countries.

Conclusion

Majority of respondents in urban and rural areas had good knowledge and positive perception of danger signs of pregnancy. Consolidating the understanding of danger signs of pregnancy will enhance the health status of the woman thus improving the maternal death burden in Nigeria. There is the need to ensure that all women receive antenatal care from a skilled provider.

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