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Sources of Malaria Information among Pregnant Women in Ebonyi State and Implications for Malaria Health Education

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Abstract
The purpose of this study was to determine sources of malaria information among pregnant women in Ebonyi state and implications for malaria education. The cross sectional research design was adopted and stratified sampling technique was used to select a total of five hundred and four (504) pregnant women from 12 hospitals in the state. A self structured and validated questionnaire was used for data collection. Pearson product moment was used to test the reliability of the instrument (r=0.83). While frequency counts and percentages were used to analyze data, chi-square was used to test the proposed hypothesis at .05 level of Significance. Results from the study showed that radio was indicated as the highest source of malaria information followed by television and antenatal clinics. Significant difference was observed in the sources of malaria information among urban and rural pregnant women. However, no significant difference was seen among women of different educational levels as regards sources of malaria information. Based on these findings it was recommended among others that health workers should make effective use of the media in the dissemination of health information. Hence malaria education programme via all aspects of the media (radio, television, and print) should be encouraged.

Background
Malaria is one of the health threats challenging the world especially sub Sahara Africa where the most dangerous species of the disease reside. Although malaria can affect every one, report indicated that pregnant women due to their reduced level of immunity have higher risk of the disease. Statistical report revealed that a total of 30 million women who become pregnant every year in places where malaria is endemic are exposed to malaria infection with severe health consequences for both mother and child. These health consequences for the mother comprise anaemia and death and for the unborn child still birth, abortion, premature birth and low birth weight (WHO 2015). Due to the deadliness of malaria, numerous measures have been advocated for the control and prevention of the disease during pregnancy and women's knowledge about these measures in part might depend on their access to information. Knowledge concerning malaria can be enhanced when information is made available through proper communication channels (Mazigo, Obassy, Mauka, Manyuri, Zinga, Kweka, Mnyonne and Heukelbach, 2010).

There are numerous sources of information through which proper health education and promotion can be communicated to the people. Source of information refers to a person or book that gives information (Merriam Webster, 2014). For this study however, malaria information was conceived as those channels or processes by which malaria messages are communicated to the people. Sources of malaria information include the mass media, public meetings, seminars, and antenatal clinics (Lwoga and Matoveto, 2005). Other sources of malaria information are newspapers, family, friends, and community meetings (Chukwuocha, Dozie, Onwuliri, Ukaga, Nwoke, Nwankwo, Nwaokoro, Nwoga, Uduijih, Iwuala, Ohaji, Morakinyo and Adindu, 2010). Among different channels of information, health workers and radio have been identified as reliable sources of malaria information among pregnant women. Anthony, Mbonye, Neema and Magnussen (2006) reported that people have trust in health workers basically because they have knowledge about health issues and can easily reach out to the masses offering one-on-one explanations. Radio messages have also turned out to be a reliable source of information especially in Nigeria. This is because the radio continues to serve as an important and factual source of information with the capacity of covering vast areas (Chukwuocha, *et al* 2010). Conversely, conflicting messages from sources such as friends, peers, magazines and other print media can result to low levels of knowledge among adults (Sungowawa, Owoaje and Faseru, 2004).

This study investigated sources of malaria information among pregnant women in Ebonyi state. This study was necessitated by the reportedly high prevalence rate of malaria among pregnant women in the state (Njoku, Obinna, Ivoke, Okereke, Joseph, 2013) and the existence of misconceptions about the cause and transmission of the disease among the study population (Omaka-Amari, 2015). This state of affair suggested the need to ascertain the sources of malaria information among the study group which is necessary for the implementation of a successful educational campaign aimed at raising the level of malaria knowledge among women in the state. Sources of information about malaria are particularly important since possession of high understanding of every aspect of malaria has significant role in the eradication of the disease. Good knowledge could help to bring down the negative effects of the disease and reduce misconceptions among the people. Women should have access to information through appropriate and reliable channels of communication in order to possess correct knowledge of malaria and its preventive measures. Available literature on malaria revealed

that study on sources of malaria information among pregnant women in Ebonyi state has not been established and thus underscored the need for the present study

The main purpose of the study, was to determine Sources of malaria information among pregnant women in Ebonyi State and implications on malaria education. Two null hypotheses were tested as thus:

1. Sources of malaria information will not significantly differ among pregnant women of different educational levels in Ebonyi State.
2. Sources of malaria information will not significantly differ among Urban and rural pregnant women in Ebonyi State.

Description of Ebonyi State

Ebonyi state which has a land mass of 5,932sq.km, lies approximately 703'N longitudes 54'E and 645'E was born in the year 1996 (Ebonyi State House of Assembly, 2006). In the past the state belonged to Abia and Enugu state south East Nigeria. According to 2006 census count, the state is inhabited by three million people (Ebonyi State Government, 2011). Ebonyi state is known for its rich savanna and semitropical vegetation. The state is characterized by humid climate, sandy and dotted marshy soil. The women just like the men are predominantly farmers, thus agriculture is the main means of livelihood. There are few civil servants, industrialists, students and business women (Ebonyi State House of Assembly, 2006).. There are more rural communities than urban. The state is made up of thirteen local government areas and thirteen general hospitals. Each local government area has one general hospital. Out of the thirteen local government areas only three are urban while others are rural areas. It is important to note that some agricultural activities coupled with humid environment enhance the breeding of mosquito and thus the spread of malaria. This factor could be responsible for the high prevalence rate of malaria in the state as reported by Njoku, Obinna, Ivoke, Okereke, Joseph, (2013). Beside, a state which is highly dominated by rural dwellers and farmers, few students and civil servants is likely to have less educated people. This factor could have also influenced women's access to health information and thus underscore the need for the present study

Methods

The study adopted the cross sectional research survey design. A sample of 504 pregnant women were draw from 14 government owned hospitals and 3 mission owned hospitals in the state using stratified sampling technique. Hospitals (17) were grouped into urban and rural. Hospitals in the urban were 4 while those in the rural were 13. Due to the limited number of urban settings and consequently few general hospitals in the urban, the four hospitals in the urban were selected for the study while simple random sampling technique was used to select eight (70%) hospitals in the rural. Finally, stochastic sampling was used to select the first 42 pregnant women in attendance for antenatal supervision on the day of data collection in each of the selected hospitals. Thus from each of the 12 selected hospitals, 42 pregnant women were chosen and this resulted in a total sample of 504 pregnant

Instrument for Data Collection.

Self-constructed and validated questionnaire was used for data collection. The instrument comprised 14 items arranged in two sections of A and B. Section A elicited questions on personal data and embodied two items relating to location, and educational qualification of participants. Section B on the other contained 12 items relating to different sources of information from where respondents were asked to indicate the source that applies to them. The instrument was subjected to a face validation by five experts in the department of health education, Ebonyi state University Abakaliliki. The reliability of the instrument was ascertained using the Pearson's Product Moment Correlation Approach. Consequently data collected from two administrations were analyzed and a correlation co-efficient of 0. 83 was obtained. This score according to Ogazi and Opkala (1994) was considered high enough and thus made the instrument reliable for use in the study

Method of Data Collection.

Approval for the study as well as access to respondents was duly obtained from hospital authorities. This enabled the researcher to have contact with the respondents for data collection. To ensure complete compliance by the respondents, a letter soliciting respondent's cooperation as well as a promissory note of confidentiality of their responses accompanied each questionnaire. Fifteen trained research assistants were recruited and trained. These assistants helped in the distribution of questionnaire and interpretation of the instrument into local language of the respondents. In order to ensure the effectiveness of the exercise, the researcher meticulously supervised distribution of questionnaires and completed copies were collected immediately.

Method of Data Analysis.

Descriptive statistics of frequency counts and simple percentages were used in analyzing data from 504 valid

copies of the questionnaire**.** Inferential statistics of chi-square was used to test the two proposed hypotheses at .05 level of significance

Results

Table 1: Description of Sources of Malaria Information among Pregnant Women in Ebonyi State (N=504)

S/N		Responses	
	Sources of malaria information	**Frequencies**	**%**
1	Radio	363	72.02
2	Television	325	64. 48
3	Antenatal clinics	301	59.72
4	Churches/mosques	210	41.67
5	Friend/family	251	49.80
6	Seminars	194	38.49
7	Community associations	192	38.10
8	Village meetings	214	42.46
9	Health workers	273	54.17
10	Health educators	228	45.24
11	Workshops	162	32.14
12	Newspapers	112	22.22

Table 1 indicates that out of five hundred and four (504) pregnant women examined, 72.02 per cent, representing 363 of the respondents got their malaria information from radio and this, according to the table indicates the highest source of malaria information among the women in the state. This was followed by television with a percentage value of 64.48, representing a total of three hundred and twenty five pregnant women (325). Table 1 further reveals that 59.72 per cent which represents a total of three hundred and one (301) of the respondents got their malaria information from the antenatal clinic. Other sources of malaria information identified by the women were health workers (54.17%), friends (49.80%), health educators (45.24%) and churches/mosques (41.67%). It is also clear that of all the sources of malaria information identified by the women, newspaper appeared to be the least source of malaria information with a percentage score of 22.22. Overall, table 1 indicates that radio (72.02%) was the highest source of malaria information among the women in the State followed by television (64.48%) and antenatal clinic (59.78%).

Table 2:Description of Source s of Malaria Information among Pregnant Women in Ebonyi State Based on Level of Education (N=504)

S/N	Sources of Information	NFE(n=79)	PE(n=141)	SE(n=181)	PSE(n=103)
		f %	f %	f %	f %
1	Radio	44 (55.70)	101 (71.63)	142 (78.45)	76 (73.79)
2	Television	36 (45.57)	103 (73.05)	110 (60.77)	76 (73.79)
3	Antenatal clinics	37 (46.84)	83 (58.87)	117 (64.64)	64 (62.14)
4	Churches/mosques	25 (31.65)	64 (45.39)	81 (44.75)	40 (38.83)
5	Friend/family	36 (45.57)	66 (46.81)	99 (54.70)	50 (48.54)
6	Seminars	29 (36.71)	62 (45.39)	60 (33.15)	43 (41.75)
7	Community associations	30 (37.97)	57 (40.43)	72 (39.78)	33 (32.03)
8	Village meetings	30 (37.97)	54 (38.30)	83 (45.86)	47 (45.64)
9	Health workers	30 (37.97)	66 (46.81)	114 (62.98)	63 (61.17)
10	Health educators	33 (41.77)	57 (40.43)	81 (44.75)	57 (55.34)
11	Workshops	17 (21.52)	33 (23.40)	67 (37.02)	45 (43.70)
12	Newspapers	15 (18.99)	15 (10.64)	50 (27.62)	32 (31.07)

Key: NFE=Non formal education, PE= Primary education, SE= Secondary education, PSE=Post secondary education

Table 2 shows that radio (73.79%), television (73.79%), antenatal clinics (62.14%), health workers (61.17%), and health educators (55.34%) formed the highest source of malaria information among women with PSE. The table also shows that women with SE indicated radio (78.45%), television (60.77), antenatal clinics (64.64%), friends/family(54.70%) and health workers(61.17%) as their highest sources of malaria information. Table 2 further shows that while radio (71.63%), television (73.05%) and antenatal(58.87%) represented the highest sources of malaria information among women with PE, radio(55.70%) was the only highest source of information for women with NFE. Overall, table 2 indicates that radio, television and antennal clinics were the highest sources of information for pregnant women in all the educational levels (PSE, SE and PE) except for women with NFE

Table 3:Description of Sources of Malaria Information among Urban and Rural Pregnant Women in Ebonyi State (N=504)

S/N	Sources of Information	Urban (171)	Rural (333)
		F %	F %
1	Radio	82 (47.95)	281(84.38)
2	Television	126(73.68)	199(59.76)
3	Antenatal clinics	63(36.84)	238(71.47)
4	Churches/mosques	76(44.44)	134(40.24)
5	Friends/family	74(43.27)	177(53.15)
6	Seminars	59(34.52)	135(40.54)
7	Community association	55(32.16)	137(41.14)
8	Village meetings	87(50.88)	127(38.14)
9	Health workers	123(71.93)	150(45.04)
10	Health educators	64(37.43)	164(49.25)
11	Workshops	67(39.18)	95(28.52)
12	Newspapers	90(52.63)	22(6.60)

Table 3 shows that urban pregnant women got most of their malaria information from the television (73.68%), village meetings (50.88%), churches/mosques (44.44%), health workers (71.91%), workshops (39.18%) and newspaper (52.63%) compared to pregnant women from the rural areas. However, most women from the rural areas indicated radio (84.38%), antenatal (59.76%), friend/family (53.15%), community associations (41.14%), seminars (40.54%), and health educators (49.25%) as their sources of malaria information.

Overall, while urban women indicated television (73.68%) and health workers (71.93%) as their highest sources of information, radio (84.38%) and antenatal (71.41%) were the highest for those in the rural.

Table 4: Chi-square Summary on Sources of Malaria Information among Pregnant Women of different educational levels in Ebonyi State

S/N	Sources	NFE	PE	SE	PSE	x^2 cal	Decision
1	Radio	44(55.70)	101(71.63)	142(78.45)	76(73.79)	14.8	S
2	TV	36(45.57)	103(73.05)	110(60.77)	76(73.79)	22.32	S
3	Antenatal clinic	37(46.84)	83(58.87)	117(64.64)	64(62.14)	7.31	NS
4	Churches/mosques	25(31.65)	64(45.39)	81(44.75)	40(38.83)	5.23	NS
5	Friends /family	36(45.57)	66(46.81)	99(54.70)	50(48.54)	2.75	NS
6	Seminars	29(36.71)	62(43.97)	60(33.15)	43(41.75)	4.68	NS
7	Community associations	30(37.97)	57(40.43)	72(39.78)	33(32.04)	1.96	NS
8	Village meetings	30(37.97)	54(38.30)	83(45.86)	47(45.63)	3.04	NS
9	Health workers	30(37.97)	66(46.81)	114(62.98)	63(61.17)	19.09	S
10	Health educators	33(41.77)	57(40.43)	81(44.75)	57(55.34)	5.81	NS
11	Workshops	17(21.51)	33(23.40)	67(37.02)	45(43.69)	16.94	S
12	Newspapers	15(18.99)	15(10.64)	50(27.62)	32(31.07)	18.98	**S**
	Overall Chi-square					**40.254**	**S**

Key: df=3 x^2 crit= 7.82, Overall= df=33 , x^2 crit= 24.996,

Table 4 indicates that pregnant women of diverse educational levels significantly differed in sources of malaria information with respect to radio, television, health workers, workshops and newspapers. These can be seen in x^2 cal values of 14.8, 22.32, 19.09, 16.94 and 18.98 respectively, which are greater than the table value of 7.82, df 3 at .05 level of significance. However, no statistical difference was observed for antenatal, churches/mosques, friends/family, seminars, community associations, and village meetings (7.31, 5.23, 2.75, 4.68, 1.96, and 3.04). Generally, table 4 shows that sources of malaria information did not significantly differ among women of different educational levels in Ebonyi State. This can be seen in an overall x^2 cal value of 40.254 which is less than the table value of 24.996 df 33 at .05 level of significance. The null hypothesis of no significant difference was accepted

Table 5: Chi-square Summary on Sources of Malaria Information among Urban and Rural Pregnant Women in Ebonyi State (N=504)

S/N	Sources	Urban (n-171)	Rural (n-333)	X^2Cal	Decision
1	Radio	82 (47.95)	281(84.38)	73.8	S
2	TV	126(73.68)	199(59.76)	9.9	S
3	Antenatal clinic	63(36.84)	238(71.47)	55.9	S
4	Churches/mosques	76(44.44)	134(40.24)	1.0	NS
5	Family/Friends	74(43.27)	177(53.15)	4.2	S
6	Seminar	59(34.52)	135(40.54)	1.8	NS
7	Community associations	55(32.16)	137(41.14)	3.7	NS
8	Village meetings	87(50.88)	127(38.14)	7.1	S
9	Health workers	123(71.93)	150(45.04)	32.1	S
10	Health educators	64(37.43)	164(49.25)	6.0	S
11	Workshops	67(39.18)	95(28.52)	5.7	S
12	Newspapers	90(52.63)	22(6.60)	138.4	S
	Overall chi-square			**181.69**	S

Key: overall = df=11, x^2 crit= 19.675

Table 5 indicates that the calculated chi-square value for radio, television, antenatal clinic, friends, village meetings, health workers, health educators, workshops and newspapers are respectively greater than the table value of 3.84, df 1 at .05 level of significance. This implies that urban and rural pregnant women differed significantly with respect to these sources of malaria information. However, the table also shows that each of the calculated x^2**cal** value for friends/family, churches/mosques, seminar and community association was less than the table value of 3.84, df 1 at .05 level indicating that urban and rural women did not significantly differ in these sources of information.

However, the overall x^2cal value of 181.69 which is greater than the table value of 19.675 df 11 at .05 level of significance shows that urban and rural pregnant women differed significantly in the sources of malaria information. The null hypothesis of no significant difference was rejected

Discussion

Sources of Malaria information

Sources of malaria information indicated in the study were radio (72.02%), television (64.48), antenatal clinics (59.72), health workers (54.17%), family/friends (49.80%), health educators (45.24%), village meetings (42.46) and churches/mosques (41.67%). Other sources of malaria information indicated by the women in the study were seminars (38.49%), community associations (38.10%), workshops (32.14%) and newspapers (22.22%). Among these sources of malaria information, radio ranked the highest source followed by television and then antenatal clinics. Newspapers were the least in the rank with a score of 22.22 percent. These results are consistent with Nwanje (2013) who also reported that radio was the main source of information among respondents while newspapers and churches hardly accounted for any malaria information dissemination. It also agrees with Amir, Mohammad-Reza, Nazanin and Nina, (2013) and Chukwuocha et al (2010) with respect to the radio, television, community association and village meetings. The result of the present study with respect to the radio and television is therefore not misleading but confirms the report that the media is a useful source of health information which can be used to reach vast majority of the people with the aim of increasing awareness and in keeping the topic in the eyes of the people (Mbore, Mlozi, and Senkoro 2007, Chukwuoach, et al 2010). It also confirms the report of Chukwuocha et al (2010) that the radio having a wide coverage has become a useful, official and authoritative channel of information in Nigeria. This result can be linked to the ongoing radio-malaria education programme in the state, which began since 2011.

Further, the result of the study with respect to antenatal clinics was amazing. This is because women during pregnancy are known to have more contact with health workers through regular antenatal supervision. It was therefore expected that in a study of this sort health workers and antenatal clinics sources could have ranked the highest. However, the place of health workers and antenatal clinics in this study may be attributed to lack of regular health education on antenatal days. An informal discussion with some if the respondents during the study revealed that some hospitals in the state schedule health education during antenatal on the booking days only which apparently is not enough. This means that a woman has the opportunity to receive health information once throughout antenatal clinic visits. In addition, the researcher observed that during antenatal clinics, pregnant women were more interested in being attended to very quickly by the doctor than listen attentively to health information which at times they consider stressful and boring. This was typical of women from the rural areas

who had to travel miles to the hospital and were always in a hurry to go back home early. At times the large crowd of pregnant women during antenatal days in some hospitals also caused health workers to play down on health information so as to have more time to attend to the heavy crowd.

It was not surprising however, that newspaper ranked the lowest as a source of malaria information in the study. First, research has shown that women are less likely to read news papers than men (Livingston, Minushkin, and Cohn, 2008). Second, Ebonyi State is dominated by rural settings occupied by mostly farmers who lack formal education. Consequently rural dwellers in the state perhaps due to inability to read, lack of money and availability of materials may have limited access to newspapers. These reasons may have contributed to the low outcome for newspaper as reported among pregnant women in the study. Another intriguing observation in the study as seen in table 11 is that sources of malaria information did not significantly differ among pregnant women of different educational levels in the state. Radio, television and antenatal clinics were the highest sources of information among women of all educational levels. This finding disagrees with the study of Livingston, Minushkin, and Cohn, (2008), which reported that Higher education levels were associated with higher likelihood of obtaining health information especially as it concerns the media. This result is not misleading because first, Malaria –Radio and television Programmes in the state are usually presented in both English and local dialect which could have made it possible for women of all educational levels to understand malaria messages via these sources of information. Second, antenatal services in the state are subsidized for all pregnant women.

The study also in table 5 showed that urban and rural pregnant women differed significantly in their sources of malaria information. While television and health workers constituted the highest sources of information for women in the urban, radio and antenatal were the highest for women in the rural. This result is not surprising since radio has very wide coverage which makes it accessible to rural dwellers. It is also affordable and easy to operate even with a battery when there is no electricity. More so, in Ebonyi State news and health issues like malaria are often presented in both English and local dialect. All these may have made it easier for rural pregnant women to be more disposed to the radio than urban pregnant women as seen in the present study. Conversely urban women were more significantly disposed to television than rural women. The reason for this result could be associated to the general epileptic power supply in the state which is made worse in the rural areas. Secondly television is more expensive than the radio. Most rural dwellers are poor farmers who may not be able to afford a television. It is also not surprising that urban and rural pregnant women significantly differed in relation to antenatal clinics with rural women demonstrating higher disposition than those in the urban. This could be due to the fact that out of the fourteen governments owned hospitals in the state, 11 are located in the rural areas. Secondly, all the government hospitals in the state offer subsidized antenatal services which may have also encouraged high attendance among the rural pregnant women.

Conclusion

Radio was identified as a source of malaria information by majority of the women followed by television and antenatal clinics. While location was significantly associated with sources of information no significant association of education on sources of information was observed among the study group.

Implications for Malaria Education

One of the findings of the study that has serious implication for malaria education was the fact that the radio and television formed the highest sources of information among the women. Although the media is good in reaching out to the masses and in keeping the topic in the minds of the people, it definitely has its own flaws. First, not everyone is disposed to media outlet especially in the rural areas. malaria education via the media gives little or no chance for questioning and clarifications. Hence, there is need for the adoption of a more efficient mechanism for malaria education in the state. The use of word-of-mouth networks is more rewarding. Montez (2011) opined that word-of mouth mechanism should be explored by public health workers, particularly among socio-economically constrained populations where there is a low level of access to media outlets. Word-of-mouth mechanisms, whether through doctors, health educators or existing social networks, act as important means of conveying health information with the potential of providing more detailed health information. Achalu, (2001) observed that this means also helps individuals to learn quicker and the result is more lasting. It is also effective in changing beliefs and misconceptions which is common in the knowledge of malaria in most population. Health educators, health workers and other concerned agencies of health information should adopt this mechanism in the dissemination of malaria information in the state. On the order hand health educators in addition to face- to-face health education technique could explore the large benefits of the media in reaching out to a large audience at the same time. Malaria education via the television or radio that allows for audience to call and ask questions may serve better purpose than those programmes that offer no opportunity for listeners to ask questions. Thus the electronic media could still serve good health education purposes when it is well utilized.

The relative implication of urban women having higher malaria knowledge and being more disposed to

sources of information has far reaching effect. This implies that rural dwellers in the state need more attention with respect to malaria information. reaching them with malaria information using local dialect will be more profitable

Recommendations

1.Since the study suggested that women get malaria information mostly from informal sources such as radio and television, it is imperative to remind health-care providers to discuss health issues like malaria with patients. This is important because pregnant women have more confidence in health information given to them by health workers.

2.It is also important that health workers should make effective use of the media in the dissemination of health information.

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