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Research Article

The Distribution of Risks of Preeclampsia in Imo State, Nigeria

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ABSTRACT

Risk of preeclampsia is a global pandemic posing serious threat to global health, acknowledging it to be a chronic and debilitating disease associated with major complications;, it significantly decreases life expectancy and ultimately leads premature death of mother and fetus. Risk of preeclampsia in all its forms imposes unacceptably high human displeasure on Imo State. Therefore, this study investigated The distribution of risks of preeclampsia in Imo State, Nigeria Southeastern Nigeria. Descriptive and analytical study designs were used in this study. Random, target and stratified sampling survey methods were employed for data collection. On the distribution of risks of preeclampsia, 948 ± 2.8174 out 2700 respondents representing 39.17% said urban dwellers are more prone to risks of preeclampsia than rural dwellers, 888 ± 3.3167 and 584 ± 1.9800 representing 36.69%and 24.13% said "No" and "No idea", respectively; with a chi-square value of 483.3141839 and p-value of <0.001, there was very high significant difference on whether there is more risks of preeclampsia on urban than rural.. Indeed, the Risk of preeclampsia is fast ravaging the health of the people of Imo state with many persons living with the diseases both in urban and rural areas.

Keywords

Distribution, Risks, Preeclampsia, Imo State.

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Introduction

Preeclampsia risks during pregnancy are the main factor in morbidity and mortality. It is the second most common factor in maternal deaths worldwide [1]. Worldwide, pre-eclampsia accounts for 2 to 8% of pregnancy problems. Preeclampsia is linked to 9% of maternal mortality in Africa, per [2]. From a global perspective, preeclampsia during pregnancy in developing nations is linked to numerous deaths [3,4]. According to the World Health Organization [5,6], developing countries have a far higher preeclampsia risk distribution than more industrialized nations. Preeclampsia typically develops near term and after 20 weeks of pregnancy. It is a pregnancy associated with newly developed high blood pressure (sBP) 160 mmHg or diastolic blood pressure (dBP) 110 mmHg, with or without the presence of proteinuria [7] The World Health Organization has identified preeclampsia as a serious and evolving global health issue. It significantly compromises quality of life, endangers the health of the entire world, and increases the risk of premature mortality [8].

In addition, both in urban and rural regions, preeclampsia is associated with several problems and attendant distribution. Preeclampsia is thought to have affected 2.9 million people in Nigeria [9,10]. Although there is a dearth of literature regarding the distribution of risk of preeclampsia in terms of age, occupation and location (urban or rural) in Imo State, Nigeria. It is challenging to develop a precise risk distribution for preeclampsia during

pregnancy in Imo State due to a paucity of trustworthy statistical data. The current study's objective is to better understand distribution of risk in preeclampsia during pregnancy in Imo State, Nigeria. The findings of this study are anticipated to contribute to the implementation of effective preeclampsia management and general preventative programs in Imo State, Nigeria.

Materials and Methods

Study area

The study was carried out in Nigeria's Imo State. One of Nigeria's 36 States, Imo State is situated in the Southeast geopolitical zone. Imo State has an area of roughly 5,100 sq km and is located between latitudes 4°45'N and 7°15'N, as well as longitudes 6°50'E and 7°25'E. It is bordered on the east by Abia State, on the west by Delta State and the River Niger, on the north by Anambra State, and on the south by Rivers State. Isu, Okigwe, Oguta, Orlu, Mbaise, Mbano, Mbaitoli, Mbieri, Orodo, Nkwere, and Orsu are among Imo State's significant cities in addition to Owerri [11].

Study Design

This study used both descriptive and analytical study designs [12]. This included the distribution of risk of preeclampsia during pregnancy. Analytical design was used to examine the determinants of the distribution, whereas descriptive design was utilized to evaluate the distribution of risks associated with pre-eclampsia during pregnancy.

Survey Methods and Sampling Technique

This study used survey methodologies that included random, target, and stratified sampling [13]. Data from the LGAs were collected using random sampling, data from the hospitals were collected using target sampling, and data from the entire state were collected using stratified methods, where each LGA served as a stratum..

Sample Size

With survey software's sample size calculator, the confidence interval and level were set at 5% and 90%, respectively. The distribution of Imo State's population by gender, age, profession, and other factors is not known with any recent accuracy. The official 2006 census served as the foundation for this study's population estimations. Imo State reported a population of 3,927,563 in the official 2006 census, per [14]. According to projections, the population will increase by 3.3% from 2006 to reach 5,408,800. Males made up 1,976,471 (or 50.3%) of the population in 2006, while females made up 1,951,092 (or 49.7%). There is no discernible difference in the proportion of men and women.

One can extrapolate from the aforementioned data since there was no official information available regarding the number of women of childbearing age. Groups of people aged 0 to 14 (1,415,929) and 65 and older (170,069) were not included because they were either too young or too old. The group of people aged 15 to 64 (2,341,565) is now left. 49.7% of the population was female overall in 2006. From the entire 15- to 64-year age range, the female population was estimated at 0.497 * 2,341, 565 = 1,163,75.

Questionnaire 1

2700 (no of questionnaires administered to each LGA depended on the population of the LGA) respondents for the general populace.

Questionnaire 2

540 (20 from each LGA) respondents for the category of distribution of risks Associated with Pre-eclampsia during pregnancy.

Method of Data Collection

Research instrument for data collection was questionnaires and materials such as blood pressure measuring kits, measuring tape and weighing balance was used for physical examination.

Questionnaires

Well-structured questionnaires were used to obtain data from respondents; the questionnaires were arranged in the following order:

Questionnaire 1

This was used to indicate information from the general populace. It was organized into distribution of Risks Associated with Preeclampsia during pregnancy.

Ethical Consideration

Prior to distributing questionnaires to respondents, letters of approval or authority to do so were submitted for approval to the management of healthcare institutions. Additionally, prior to distributing the surveys, permission from persons at risk for preeclampsia during pregnancy in urban and rural areas was obtained. Before the entire public was given the surveys, similar consent was requested from them.

Data Presentation and Statistical Analysis

The association between the distribution of risks of preeclampsia during pregnancy and age was measured using correlation and regression analysis, in which case r (correlation coefficient) and r2 (coefficient of simple determinant) were obtained using SPSS statistical software version 17.0.

Tables and charts with the generated data were created. Data that were produced in accordance with various parameters that were taken into consideration in this study were measured for correlation using descriptive statistics, including mean, relative standard error, and standard deviation. Version 17.0 of the statistical program SPSS was used for this [15]. Patients' perceptions of risk factors for preeclampsia and complications were evaluated using chi-square.

Utilizing computer-aided software, GenStat Statistical Software, the coefficient of variation (% CV), which measures variability, was calculated for the data collected from the various LGAs [16].

Results

This research work titled: "distribution of Risks Associated with Pre-eclampsia during pregnancy in Imo State. The data and results that were obtained from this research study were presented in Tables

Distribution of Risk of Preeclampsia (1)

The distribution of risk of preeclampsia (1) is laid out in Table 1 below.

On whether urbanization contributes to risk of preeclampsia, 948 (39.17%) respondents answered positively, 888 (36.69%) responded negatively while 584 (24.13%) had no idea. A chi-square test of significance gave a value of 576.19 which is highly significant at $p<0.001$.

The results showed that 835(33.68%) of respondents had no idea if urban dwellers were more prone to preeclampsia risks than rural dwellers, 838 (33.80%) responded positively while 806 (32.51%) responded negatively. A chi-square statistical test gave a value of 629.7540544 which was very highly significant at $p<0.001$.

Distribution of risk of preeclampsia (2)

The distribution of preeclampsia (2) is shown in Table 2 below. Out of all the responses, 951(38.12%) of the respondents answered no to risk of preeclampsia being more in the educated than in the uneducated, 891 (35.71%) said they had no idea while 653(26.17%) answered yes. A chi-square test gave a value of 470.2237 which was very highly significant at $p<0.001$.

Distribution of Risk of Preeclampsia (3)

Table 3 below shows the distribution of risk of preeclampsia (3). The results show that risk of preeclampsia is most among upper -level white collar (Managers, Directors, and above)

Table 1: Distribution of risk of preeclampsia (1)**.**

	Do you think urbanization contributes to risk of preeclampsia?				**Are urban dwellers more prone to risks of preeclampsia than rural dwellers?**			**Is risk of preeclampsia more in older women than young women?**		
Local Govt. Area	**Yes**	**No**	**No idea**		**Yes**	**No**	**No idea**	**Yes**	**No**	**No idea**
Aboh Mbaise	28	20	48		19	16	60	39	15	49
Ahiazu Mbaise	22	14	21		13	15	22	14	26	63
Ehime Mbano	21	63	15		34	44	11	11	40	40
Ezinihitte Mbaise	11	50	18		44	16	19	20	34	45
Ideato North	41	21	28		13	50	27	23	34	40
Ideato South	19	60	26		57	24	16	25	28	50
Ihitte/Uboma	47	19	27		55	15	17	10	42	52
Ikeduru	28	50	19		41	16	20	16	20	42
IsialaMbano	47	25	11		20	58	23	15	20	46
Isu	55	19	17		28	60	15	35	23	46
Mbaitoli	18	40	20		49	38	25	20	26	43
NgorOkpala	51	13	16		54	22	23	21	25	47
Njaba	41	20	19		19	50	17	20	14	60
Nkwerre	28	58	18		57	23	17	12	14	72
Nwangele	54	19	13		18	50	16	20	20	52
Obowo	51	14	19		18	25	53	24	40	36
Oguta	19	62	15		50	23	15	13	22	55
Ohaji/Egbema	50	29	15		18	50	21	14	21	50
Okigwe	42	29	15		29	28	40	29	26	40
Onuimo	47	19	21		20	60	25	20	21	45
Orlu	16	42	25		41	35	19	32	17	44
Orsu	50	25	23		26	15	55	24	18	57
Oru East	56	25	16		27	12	52	25	40	30
Oru West	25	60	13		25	14	58	22	17	49
Owerri Municipal	39	50	12		23	19	52	22	20	50
Owerri North	14	20	46		18	15	60	15	16	60
Owerri West	28	22	48		22	13	57	15	19	63
Total	948 (39.17%)	888 (36.69%)	584 (24.13%)		838 (33.80%)	806 (32.51%)	835 (33.68%)	556 (21.8%)	658 (26%)	1326 (52.20%)
Mean	35.11	32.89	21.63	31.03	29.85	30.92	20.59	24.37	49.11	35.11
St. D	± 2.81	± 3.31	± 1.98	± 2.8	± 3.19	± 3.34	± 1.39	± 1.64	± 1.77	± 2.81
X^2-value (p-value)	483.3141839 (5.77×10^{-59})				629.7540544 (2.6654×10^{-86})			170.6576 (1.59692×10^{-08})		

*****=Very highly significant at p<0.001**

Table 2: Distribution of risk of preeclampsia (2).

	Is risk of preeclampsia more in the educated than the uneducated?		
Local Govt. Area	Yes	No	No idea
Aboh Mbaise	20	15	18
Ahiazu Mbaise	23	20	57
Ehime Mbano	16	21	55
Ezinihitte Mbaise	21	58	19
Ideato North	20	50	27
Ideato South	18	46	19
Ihitte/Uboma	21	46	19
Ikeduru	27	32	33
IsialaMbano	10	22	67
Isu	25	12	61
Mbaitoli	40	32	20
NgorOkpala	18	56	19
Njaba	25	52	23
Nkwerre	26	44	19
Nwangele	22	49	14
Obowo	20	43	14
Oguta	22	56	21
Ohaji/Egbema	25	53	17
Okigwe	19	55	19
Onuimo	20	40	29
Orlu	35	24	25
Orsu	39	17	60
Oru East	30	25	53
Oru West	30	22	60
Owerri Municipal	13	18	52
Owerri North	18	22	53
Owerri West	50	21	18
Total	653 (26.17%)	951 (38.12%)	891 (35.71%)
Mean	24.18	35.22	33
St. D	± 1.6752	± 2.9624	± 3.5309
X^2-value (p-value)	470.2237 (1.38257×10^{-56})		

*****=Very highly significant at p<0.001**

with (41.56%) of all responses while middle-level white collar (Administrative office staff, etc) had (32.95%), Lower white-collar (Messengers, clerical staff, drivers, etc) had (14.99%) and Blue-collar (Labourers or workmen) had the lowest with (10.50%)A chi-square test yielded a value of 384.3786275 which was very highly significant at p<0.001.

Discussion

Distribution of Pre-Clampsia Risks During Pregnancy: Using Imo State, Nigeria as the Focal Point is core of this discussion. Major concerns have been raised about the distribution of risks related to pre-clampsia during pregnancy in Imo State. Imo State has 27 local government areas (LGAs), which are divided into three political zones: Imo North (Okigwe Zone), Imo Central (Owerri Zone), and Imo West (Orlu Zone) (LGAs). The following is an alphabetical listing of these local government areas (LGAs): Ikeduru, Isiala Mbano, Isu, Mbaitoli, Ngor Okpala, Njaba, Nkwerre, Nwangele, Obowo, Aboh Mbaise, Ahiazu Mbaise, Ehime Mbano, Ezinihitte Mbaise, Ideato North, Ideato South, The results of the investigation are shown below.

Preeclampsia is now well acknowledged as a potential problem. It is immediately identified as "high blood pressure in early pregnancy [17]" due to its alarming nature. Almost everyone who was tested or interviewed in this study referred to the illness that was being studied as a "sickness that hurt the embryo." However, the following section discusses the preeclampsia risk distribution in Imo State.Preeclampsia risk is distributed according to age.

The age group of 37–46-year-olds was found to have the largest percentage of residents in the State who were at risk for preeclampsia (27.2%). With equal percentages of 13.8%, 15.7%, 23.7%, and 19.7% of people in Imo State living with the condition, the age categories of 16 to 26, 27 to 36, and over 47 came next. When these two age ranges are combined, the percentage for people who are older than 37 is 46.9%. Nearly half of all people at risk for preeclampsia are aged 37 to 47. More than 80% of this age group's preeclampsia risk factors live in low- and middle-income countries (WHO, 2017). In this study, preeclampsia risks were found in 11.33 percent of cases, compared to 2.8% found by the WHO in the same age range. Like this, it was found that

Table 3: Distribution of preeclampsia risks (3).

	Which among the following have risk of preeclampsia most?				Area you have lived more in your entire life	
Local Govt. Area	**Blue-collar (Labourers or workmen)**	**Lower white-collar (Messengers, clerical staff, drivers, etc)**	**Middle–level white-collar (Administrative office staff, etc)**	**Upper-level white-collar (Managers, Directors and above)**	**Urban area**	**Rural area**
Aboh Mbaise	7	11	31	41	4	18
Ahiazu Mbaise	5	6	53	32	7	16
Ehime Mbano	5	13	35	42	5	13
Ezinihitte Mbaise	10	11	25	49	9	11
Ideato North	16	10	23	46	5	15
Ideato South	12	12	27	50	6	11
Ihitte/Uboma	8	14	49	24	10	12
Ikeduru	10	13	38	43	5	15
IsialaMbano	13	13	27	43	3	16
Isu	9	11	20	56	4	16
Mbaitoli	14	11	11	50	13	9
NgorOkpala	10	12	16	50	6	18
Njaba	9	14	18	50	7	14
Nkwerre	12	12	16	24	9	13
Nwangele	10	11	27	45	7	11
Obowo	10	8	44	24	5	13
Oguta	12	8	42	33	7	15
Ohaji/Egbema	9	12	52	21	7	14
Okigwe	10	14	20	49	10	7
Onuimo	9	9	57	22	11	10
Orlu	10	13	23	37	14	3
Orsu	6	13	52	27	6	13
Oru East	7	43	25	25	11	11
Oru West	4	7	40	36	10	12
Owerri Municipal	6	44	15	33	11	7
Owerri North	15	15	22	48	11	7
Owerri West	14	14	14	37	12	12
Total	262 (10.50%)	374 (14.99%)	822 (32.95%)	1037 (41.56%)	215 (39.31%)	332 (60.69%)
Mean	9.70	13.85	30.44	38.41	7.96	12.29
St. D	± 0.6034	± 1.7019	± 2.6496	± 2.0466	± 0.5809	± 0.6852
X^2-value (p-value)	384.3786275 (6.29051×10^{-33})				53.04264(0.472516)	

*****=Very highly significant at p<0.001**

patients' initial diagnoses of the disease were made while they were between the ages of 37 and 46.

This raises serious concerns because the WHO study included all preeclampsia cases while our analysis only looked at connections between preeclampsia risks. The WHO also predicted that this age group would continue to have the highest frequency of preeclampsia in the coming years. By 2045, it is expected that the number would increase dramatically. Once more, low- and middle-income countries will be home to more than 80% of the world's population [18].

This study found that preeclampsia risks increased with age, peaked at age 46, and then began to decline among the various age groups. A regression analysis revealed that the study participants' chances of developing preeclampsia rose in direct proportion to their age. This shows that the prevalence of preeclampsia hazards in the general population is significantly influenced by age. Furthermore, there is no association between age groups and the prevalence of preeclampsia patients. It was significant at p 0.05, in other words.

Distribution of Preeclampsia Risk by Urban/Rural Area

The results of this study show that preeclampsia risks are higher in rural Imo State than in urban areas. The findings of [19] who asserted that preeclampsia risks are higher in urban than in rural places, are not supported by the statistics for rural areas, despite the fact that they are rising. People in urban rather than rural areas are more at risk for preeclampsia in low- and middle-income

countries. By 2035, the disparity is expected to widen. There are statistical differences (p0.05) between individuals who live in rural areas and those with preeclampsia risks who live in urban areas. This indicates a substantial disparity between the population or percentage of people exposed to health risks in urban and rural locations.

Preeclampsia Risks Are Distributed By Occupation.

According to research, skilled workers in the field of employment have a higher preeclampsia rate than unskilled workers. This conclusion is in line with that of [19,20] who noted that preeclampsia is less common in white-collar workers than in middle- and upper-level white-collar workers and more common among blue-collar workers (defined as those who perform work requiring strength or physical skill as opposed to office work). Female blue-collar workers are twice as likely to develop preeclampsia. Because of this, there are less skilled workers in Imo State than there are skilled workers who are at risk for preeclampsia.

Conclusion

As many victims of preeclampsia are unaware of their disease, the threats it poses to inhabitants of Imo State's urban and rural areas are quickly compromising their health. Preeclampsia risks were dispersed differentially around the state.

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