Assessment of the Level of Knowledge and Management Practices of Preeclampsia among Pregnant Women in Southwest Nigeria

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Abstract

Background: Preeclampsia (PE) is a critical condition that poses a significant risk of maternal and fetal mortality, particularly in underdeveloped countries with limited access to health care. In such countries, the incidence of preeclampsia during pregnancy is estimated to be 10%. This study aimed to assess the understanding and management of PE care in pregnant women in Southwest Nigeria. Despite its high prevalence, there is a lack of information regarding the best management strategies for preeclampsia in the study location.

Methods: A descriptive cross-sectional design was employed, and 331 individuals were recruited from 2,283 expectant mothers in the East Senatorial District of Osun State through a multi-stage selection process.

Results: The participants demonstrated an average knowledge score of 10.2 out of 5.0, and 47.7% had a working knowledge of preeclampsia. However, less than half of the participants (46.2%) had completed secondary school.

Conclusion: Based on these findings, it can be concluded that expectant mothers generally possess a reasonable level of knowledge regarding preeclampsia. However, this study emphasizes the importance of enhancing women's knowledge of preeclampsia through various means such as health education in maternity hospitals, media outlets, and national education programs.

Keywords: Knowledge, management practices, maternal mortality, preeclampsia, Nigeria

Introduction

Preeclampsia (PE), a condition characterized by increased blood pressure in women with normal blood pressure, is a major health problem worldwide. According to the International Federation of Gynecology and Obstetrics (FIGO, 2020), systolic and/or diastolic blood pressure values of 140 and/or 90 mmHg measured every four hours indicate preeclampsia. The World Health Organization (WHO, 2019) states that preeclampsia (PE) affects 2–10% of women globally and is another significant cause of maternal death in sub-Saharan Africa. Preeclampsia (PE) is a major contributing factor to

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Nigeria's lamentable position among countries with the highest maternal mortality rates worldwide (Salamon et al., 2019). Preeclampsia (PE) remains a risk factor for maternal mortality, even after different intervention strategies have been used at the national and subnational levels to lower maternal mortality (WHO, 2019). Significantly, 20% of all maternal deaths during the previous 20 years occurred in Nigeria.

A condition known as PE is a precursor of eclampsia, which in turn can cause neonatal death, placental abruption, premature birth, and underweight neonates. In the future, it may increase the risk of venous thromboembolism, heart issues, stroke, and other illnesses. Furthermore, preeclampsia may result in acute kidney disease, liver damage, stroke, and blindness of the mother's organs. Notwithstanding the gravity of this ailment, women in Ogun State, Nigeria, lack adequate knowledge of its symptoms. They frequently use herbal remedies and conventional medications and typically attribute preeclampsia to stress. This information is based on several publications, including a study by Okhae and Arulogun (2015), who discovered that stress was the primary cause of the disease among pregnant women in Ondo State.

Fortunately, research suggests that taking a daily dose of 100–150 mg of aspirin at bedtime before 16 weeks of pregnancy can lower the risk of developing preeclampsia (Wertaschnigg et al., 2019). Traditional remedies include herbal medicines, counseling, and hospital visits. However, pregnant women need basic knowledge to enable effective prevention, control, and treatment of the condition. Studies indicate that women who understand their condition better are more likely to follow treatment plans, seek medical attention promptly, and have better outcomes. Hence, educating women about PE symptoms is crucial to ensuring timely and appropriate treatment.

Literature Review

Epidemiological Review of Preeclampsia

According to the International Federation of Gynecology and Obstetrics (FIGO, 2020), early pregnancy-related hypertension may have detrimental effects on the mother and fetus. Doctors worldwide face a challenge in managing these risks while preserving fetal development and growth in women with preeclampsia. Several risks are associated with these conditions, including an abnormal decrease in the number of blood cells involved in clot formation, liver damage, and placental blockage. Improper management of preeclampsia can result in eclampsia. Preterm and small-for-gestational-age (SGA) babies are more likely to die at birth and experience more health problems. Akaba et al. (2021) found that preeclamptic women might have long-term health problems. Among these issues, there is a higher risk of stroke, diabetes, hypertension, metabolic

syndrome, cardiovascular disease, and renal impairment.

According to Poon and Nicolaide (2020), women with early pre-eclampsia frequently experienced a ten-year reduction in life expectancy. Additionally, there are clear long-term effects on children, including a higher incidence of diabetes mellitus, hypertension, coronary heart disease, and insulin resistance, in children born to preeclamptic mothers. Research conducted in Abuja to ascertain the prevalence and effects of pre-eclampsia on the mother and fetus found a case fatality rate of 3.9% (Akaba et al., 2021).

Prevalence of Preeclampsia in Developed Countries

Many studies have been conducted to determine the prevalence worldwide, and according to Agrawal and Walia (2014), 55.6% of pregnant women live in India. Ray et al. (2016) study found that it was more common in Canada (4.0%), the Philippines (1.54%), Colombia (1.68%), and Jamaica (2.06%), per 1000 people when looking at mothers born in different countries. Beley and Wudad (2019) reported that 12.4% of pregnant patients attending prenatal clinics had pre-eclampsia. Machano and Joho (2020) revealed that pre-eclampsia affected 26.3% of the UK population.

Kononikhin et al. (2020) study used urine samples taken from pregnant women to categorize different pre-eclampsia diagnoses. After examining 127 samples, 25 were found to have mild preeclampsia and 25 had severe preeclampsia. According to Mou et al. (2021), preeclampsia is estimated to affect 14% of pregnant women in Bangladesh. However, 10% of these women developed the illness after 20 weeks of pregnancy, despite having no prior history of hypertension. In the United States, the prevalence of chronic hypertension and gestational hypertension was 14.3% and 13.8%, respectively, among the unspecified total number of deliveries. The total prevalence of hypertension has increased by 17.8%, ranging from 10.3% to 28.1%.

Prevalence of Preeclampsia in Africa

In Africa, preeclampsia is a serious medical condition that contributes significantly to maternal and pediatric deaths. Preeclampsia is thought to be the cause of 76,000 maternal and 500,000 deaths annually. Numerous African nations have high rates of the condition, such as Togo, where 9% of the population is affected, and Rwanda, where 1% is affected. In Ethiopia, PE accounts for 10% of maternal fatalities. Of the 88 cases in Kenya, 94.3% had preeclampsia, which is also common in Zanzibar common (Vata et al.,2015).

Numerous investigations carried out in Nigeria have brought attention to the alarmingly high incidence of preeclampsia. The incidence rate in Jos was 8.8%, and 34.4% of deaths in southeast Nigeria were attributed to preeclampsia. Preeclampsia (PE) is a leading cause of maternal death

in Nigeria and contributes to 20% of all maternal fatalities worldwide. Therefore, this is a critical issue that requires further attention. Although preeclampsia cases are still prevalent in other regions of Nigeria, a study conducted in Rivers State, specifically in Port Harcourt, revealed that 26.6% of the population experienced preeclampsia, with 73.4% of them having severe PE. Preeclampsia is a common occurrence in southwest Nigeria, accounting for 69.8% of cases, while in the north-central region; it is responsible for 3.2% of cases (Awoyeku et al., 2020)

Knowledge of Preeclampsia

Several studies have shown that lack of knowledge about PE is linked to several health problems. According to Okhae and Arulogun (2015), traditional beliefs are a cause of pre-eclampsia in Nigeria and India. Women who answered fewer than half of the survey questions correctly had the highest level of knowledge. The study's instrument had two questions that revealed traditional beliefs, asking whether being near a fire or evil spirits could cause PE. The participants attributed preeclampsia to exposure to fire and the existence of an evil spirit. They also mentioned that stress, whether from daily life, pregnancy, domestic issues, or overthinking, was the most common cause of preeclampsia. Despite this, many women are still unaware of the challenges associated with preeclampsia and how they can affect the health of both the mother and infant.

Ghanaian women have limited knowledge about preeclampsia, its symptoms, and its characteristics. In a study conducted by Fondjo et al. (2019), only 11.4% of women had sufficient knowledge of PE. Among those with sufficient knowledge, higher educational attainment was the most prevalent factor that made it easier for them to understand their illness. Additionally, only 32% of the respondents were able to accurately identify preeclampsia symptoms. Remarkably, only 11% of the women who participated in the study had sought medical attention for PE, while 31% had never done so. Although PE counseling was provided to expecting women, 40–50% of the respondents (out of a possible 22) said they did not fully understand it. However, Joshi et al. (2020) found that higher education and knowledge scores were associated with increased provider counseling and better understanding of preeclampsia.

Studies conducted by Mekie et al. (2020) shed light on the level of PE understanding among different groups of people. According to Mekie et al., only 29.3% of the participants understood preeclampsia well, while 70.7% had insufficient knowledge about the illness. The study also revealed that women who received antenatal care had a better understanding of preeclampsia than those who did not. Additionally, those who were scheduled for antenatal care in the first trimester and those who had problems with a previous delivery were more likely to have preeclampsia.

Olaoye et al. (2019) evaluated the degree of awareness and management of pre-eclampsia among medical staff in antenatal hospitals in Lagos. The study found that these medical staff had moderate knowledge of PE, with only 14.5% of the respondents having great knowledge and 16.4% having low understanding. Interestingly, the study found that years of experience was strongly correlated with knowledge level. Similarly, health care providers in the community of Ogun State showed a good level of knowledge about PE. They had a thorough understanding of the symptoms of the illness and knew when a patient might be at risk (Sotunsa et al., 2016).

Methodology

A cross-sectional design was used in this study. This design was selected because it captures a specific moment in time and allows researchers to collect data from a large population.

Research Setting

The study was conducted in Osun State, southwest Nigeria, in the Eastern Senatorial District. The state shares its boundaries with Ogun State to the south, Kwara State to the north, Oyo State to the west, and the Ondo and Ekiti States to the east. The total land area is 9,026 square kilometers, stretching from 7.5629 °north to 4.5200 °east, as reported by Nigeria's National Population Commission in 2016. The state is comprised of three federal senatorial districts, each divided into three administrative zones. These districts are Osun Central, Osun East, and Osun West. As of 2016, the state had a population of 4,705,600. The Osun East Senatorial District, where the study took place, comprises of ten local government areas.

Sampling Technique

With 2,283 pregnant women in the population, the Leslie Kish formula yielded a sample size of 331. Kish (1965) created this formula in 1965 for use in quantitative research. A simple random technique was used to select respondents from the target population to guarantee impartial selection. The Osun East Senatorial District was divided into ten local governments, which served as strata.

Seven local government areas were selected using simple random sampling. Each Local Government Area was provided with a unique code to ensure that every Local Government Area (LGA) had an equal chance of being selected. Using this method, 25 health facilities were selected from 22 public health facilities and two private facilities in the study location. Since there were more eligible pregnant women in each facility compared to the sample calculated for each local government, proportionate sampling was used to select pregnant women to be interviewed per facility.

Data Collection Instrument

A data collection instrument was developed (Cronbach's alpha, $\alpha = 0.97$) to capture the level of knowledge and management practices regarding PE among pregnant women in the

study location. The instrument was designed based on the identified research objectives and the Health Belief Model (HBM) conceptual framework. Data were collected using an interviewer-administered, validated questionnaire. Cronbach's alpha score of .924 and .862 were obtained for knowledge and management practices, respectively.

Data Analysis

Statistical analysis was performed using IBM SPSS® (version 23). This tool was chosen to assess the women's understanding of and treatment approaches for PE. Descriptive statistics are presented in frequency tables, and correlations. Using Ireye et al. 's(2019) classification, this study also classified PE knowledge scores as bad (less than 7), fair (7–14), and excellent (14–21). The PE management scores of the respondents were then calculated. There were three categories of management practices: less than nine were regarded as poor practices, nine to eighteen moderate, and more than twenty-seven good management practices. A Bivariate Pearson Correlation analysis was conducted to ascertain the relationship between management practices and knowledge levels. Statistical significance was set at $P < 0.05$

Ethical Considerations

Before conducting this study, ethical clearance was obtained from the Babcock University Health Research and Ethics Committee and Osun State Ministry of Health. In addition, the nature of the study was explained to the participants who were assured that their responses would be confidential. They were informed that participation was voluntary and that they could withdraw at any time without penalty. Additionally, we ensured that each participant provided formal consent by reading and signing a consent form before the data-collection exercise.

Results

Table 1 presents the participants' sociodemographic characteristics. More than half (52.6%) of the participants were aged between 26 and 34 years, with an average age of 31.05 ± 5.07 years. This age group is typically associated with reproductive age, which explains its high prevalence. Moreover, the majority (84.3%) of the respondents were Christians, which reflects the Christian-dominated areas in which the study was conducted. Additionally, 85.2% of the respondents belonged to the Yoruba ethnic group, which constitutes the majority of the population in the southwest region where the study was conducted.

Table 1

Sociodemographic Characteristics of Respondents

Sociodemographic variables for consideration	Respondents N=331	
	Frequency(n)	Percentage (%)
Age (in years) mean age = 31.54 ± 5.7 years.		
17-25	5	15.4
26-34	174	52.6
35-43	149	31.1
44 and above	3	0.9
Ethnicity		
Yoruba	282	85.2
Igbo	44	13.3
Other	3	0.9
Hausa/Fulani	2	0.6
Religion		
Christianity	279	84.3
Islam	48	14.5
Traditional	4	1.2
Educational Status		
Secondary	153	46.2
University	104	31.4
Primary	47	14.2
Non-Formal	27	8.2
Marital Status		
Single	24	7.3
Married	269	81.3
Divorced	21	6.3
Separated	10	3.0
Widowed	7	2.1
Number of Children		
One	162	48.9
Two	93	28.1
Three	44	13.3
Greater than Three	32	9.6
Parity		
Multiparous	331	100

Level of Preeclampsia Knowledge among Pregnant Women

The level of PE knowledge among the respondents is presented in Table 2. A 20-point rating scale was used to measure this, with an average score ranging from 10. 2 to 5.0. Additionally, the respondents' knowledge level regarding PE was divided into three groups: low, defined as less than or equal to 7; and high, defined as more than 7 to 14 (>7). 14) and more than 14–21 (>14–21). Less than half (47.7%) of respondents had knowledge of PE. Age and number of children were associated with knowledge of the condition.

Table 2

Level of Preeclampsia Knowledge

	Respondents (N= 331)	
	Yes (%)	**No (%)**
Elevated Blood pressure considered to be hypertensive is 140/90MMHg with protein in the urine and edema	47.7	52.3
Hypertension only affects pregnant women	28.1	71.9
Pregnant women develop complications during pregnancy as a result of hypertension	36.6	63.4
The second and third trimester of pregnancy is affected by Hypertension	41.7	58.3
High Salt intake can cause hypertension in pregnancy.	52.3	47.7
High consumption of fat and oil can cause hypertension in pregnancy	55.9	44.1
Cigarette smoking and the use of alcohol can cause hypertension in pregnancy	58.3	41.7
Hypertension in pregnancy can be prevented	60.4	39.6
An episode in which one experiences rigidity and uncontrollable muscle spasms along with altered consciousness during pregnancy is hereditary	50.2	49.8
Healthcare provider counsel/educate/talk to me about hypertension in pregnancy before now?	56.2	43.8
Hypertension in pregnancy has no cure	55.0	45.0
Separation of the placenta from the uterus	40.5	59.5
Development of low platelet	37.2	62.8
Destruction of red blood cells which can later lead to shock	45.6	54.4
Damage or disease in the heart's major blood vessels supplying the heart muscle	51.4	48.6
A disease of the blood vessels supplying the arms and legs	51.4	48.6
A sudden, unexpected loss of heart function, breathing, and consciousness	53.5	46.5
Stroke (Damage to the brain from interruption of its blood supply)	45.0	55.0
Birth defects that affect the normal development and functioning of the heart structure from birth	45.9	54.1
Blood clots in the leg vein which can dislodge and move to the heart and lungs	44.4	55.6
Unborn child can suffer from placenta insufficiency and uterine growth retardation	51.4	48.5

Management Practices of Preeclampsia

The main methods of treating PE are either delivering the child or treating the condition until the mother is in the best possible condition for childbirth or until she is no longer able to maintain pregnancy. Healthcare providers often refer expectant mothers to tertiary hospitals; however, this occasionally occurs after the mothers have registered past the deadline. Pregnant women still choose to give birth at home rather than at a local health facility. When traditional birth attendants are unable to control the situation and send pregnant women to private or tertiary hospitals, they are not always in the best position. Observation made was that Most women

unexpectedly admitted to tertiary and secondary hospitals, especially in rural areas, lack adequate knowledge of PE. Due to inadequate treatment and unhealthy behaviors of pregnant patients, preeclampsia claims the lives of women from this region of the state in tertiary and secondary hospitals every year.

Table 3 present respondents' PE treatment practices . A 27-point rating scale was used to measure this, and the average score of 9.2 ± 3.41 was recorded. Three categories were created based on respondents' PE treatment practices: poor (9), fair (<9–18), and good (<18–27). Based on the experiences of pregnant women at the study site, the researcher divided the respondents' management practices into three categories. The majority of respondents (61.6%) had effective PE management techniques.

Table 3

Respondents Management Practices of Preeclampsia

	Not at all (%)	Rarely (%)	Occasionally (%)	Very often (%)
I am not on any medication	11(84.6)	1(7.7)	-	1(7.7)
I pray to God and that's all	9(69.2)	3(23.1)	-	1(7.7)
I call the attention of my clinic when my blood pressure rises at any point in time whether on clinic day or not.	8(61.5)	2(15.4)	1(7.7)	2(15.4)
I make use of herbal treatment	7(53.8)	3(23.1)	-	3(23.1)
I check my blood pressure	5(38.5)	4(30.8)	3(23.0)	1(7.7)
I make use of medications prescribed in the hospital	3(23.1)	5(38.5)	1(7.6)	4(30.8)

Table 3 shows the percentage of women who currently had preeclampsia during pregnancy who reported using the prescribed medication (30.8%), herbal remedies (23%), visiting the hospital (15.3%), whether or not it is their clinic day, not using any medication (7.6%), and praying to God (7.6%).

Relationship between Knowledge and Management of Preeclampsia

Table 4

Pearson Correlation Showing the Relationship between Level of Knowledge and Management of Preeclampsia

Knowledge	R	Sig. (2 tailed)
Management of pre-eclampsia	0. 111*	0.044

Based on the analysis conducted, the result of the analysis revealed that there was no statistically significant relationship between the level of knowledge and management of Pre-eclampsia ($r = 0.111$ $p = 0.044$). Thus, respondent's management of preeclampsia is related to their knowledge of preeclampsia. This implies that the higher the level of knowledge of preeclampsia, the better the respondent's management of pre-eclampsia or vice visa.

Discussion

Sociodemographic Characteristics of the Respondents

The study found that respondents ranged in age from 18 to 52 years, with a mean age of 31.54 ± 5.7 years. This is comparable to the results of Fondjo et al. (2019), who found a similar average age. Nevertheless, the average age reported in this study differs slightly from that reported by Olaoye et al. (2019), who reported a mean age of 35.45 ± 7.62 years. The study also found that most respondents were Yoruba and Christian ethnic groups, which is likely because the study was conducted in southwestern Nigeria, where the Yoruba population is predominant and Christianity is widespread.

Knowledge of Preeclampsia

The findings of the current study indicate that the respondents accurately defined pregnancy-induced hypertension, which included edema and an elevated blood pressure of 140/90 mmHg. Most respondents were correct in their opinion that high blood pressure can cause pregnancy-related complications. Approximately half of those surveyed acknowledged that alcohol intake and cigarette smoking can lead to hypertension during pregnancy. The study also revealed that respondents had an average understanding of PE, which is consistent with the findings of Olaoye et al. (2019). In a specific hospital in the South Gondar Zone in Ethiopia, 28% of women receiving ANC had adequate awareness of PE, which is higher than the findings of the Ghanaian study (Fondjo et al., 2019) but lower than that reported in a study conducted in hospitals in northern Ethiopia (Berhe et al., 2020).

This study indicates a strong correlation between PE and knowledge of managing the condition. Previous research has highlighted that there is insufficient awareness among women regarding PE. For instance, You et al. (2012) revealed that only 14% of American women could accurately describe PE, despite 43.3% being aware of the condition. Similarly, Teng and Keng (2016) found that only 18.4% of Malaysian women had sufficient knowledge of preeclampsia. According to Savage and Hoho (2016) further research, 59% and 60% of Tanzanian women have inadequate knowledge of PE. A thorough understanding of a patient's illness can help prevent complications and positively influence treatment adherence.

Management of Preeclampsia

The results of this study demonstrated that the respondents managed their PE well. Less than half of the respondents said they took the prescribed drugs, a few said they utilized herbal remedies and reported that they did not take any drugs, 7.6% said they prayed to God, and 15.3% said they visited the hospital whether it was their clinic day or not. This result is in line with the findings of Nabulo et al. (2021) for Sokoto. This study is also consistent with a study by Duley et al. (2006) that examined preeclampsia management practices and observed that low doses of aspirin reduce preeclampsia risk and infant mortality. Similarly, results from cross-sectional observational studies conducted in six countries in sub-Saharan Africa revealed that pregnant women with PE were prescribed magnesium sulfate (Barbara et al., 2018). Additionally, Duley et al. (2006) found that calcium supplements benefit patients in underdeveloped nations who consume less dairy products.

Conclusion

The majority of respondents were married and belonged to the Yoruba ethnic group. More than half of them were employed by the working class, and the remaining half were self-employed. All patients were multiparous. The following three levels of PE knowledge were measured: low, adequate, and good. In accordance with this classification, over half of the respondents had a moderate-to-decent understanding of PE. Three categories were created from respondents' responses regarding their management methods: low, moderate, and good. Throughout this study, the majority of women with PE had positive behavior towards PE, which had an impact on them.

The results of the study showed a significant relationship between knowledge level and treatment techniques. Therefore, the manner in which respondents address PE is influenced by their comprehension of it. This emphasizes the necessity of stepping up initiatives to increase women's knowledge of PE to enhance pregnancy outcomes. Some ways in which education can be provided are through national education programs, media channels, and contextual health education at ANC. Health providers should prioritize health education that covers PE risk factors, symptoms, and consequences during prenatal care visits. Improving women's understanding of PE is essential to encourage facility deliveries and increase ANC visits.

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