

**ASSESSMENT OF RISK FACTORS ASSOCIATED WITH PREGNANCY-INDUCED
HYPERTENSION AMONG WOMEN IN ILORIN WEST LOCAL GOVERNMENT KWARA STATE,
NIGERIA**

BY

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Abstract

This study assessed the risk factors associated with pregnancy-induced hypertension (PIH) among women in Ilorin West Local Government Area, of Kwara State, Nigeria. The main objective of the study is to identify the risk factors responsible for PIH and Determine the significance of these factors. A descriptive survey research design was employed, utilizing a structured questionnaire to collect data from 150 pregnant women. The study found that obesity, advanced maternal age, and a family history of hypertension were significant risk factors for PIH. Additionally, lifestyle factors such as smoking, alcohol intake, and lack of physical exercise were identified as contributors to the condition. The results revealed a strong association between sociodemographic factors and the risk of PIH with statistical value of $p > 0.05$ meaning F-value greater than 0.05 computed at 95% confidence interval. Obesity and advanced maternal age were particularly influential, with significant correlations found between these factors and the likelihood of developing PIH. Furthermore, the study highlighted the role of family history in increasing the risk of PIH, suggesting a genetic predisposition to the condition. The study concludes that PIH is a significant public health concern in the region, with several modifiable risk factors contributing to its prevalence. The findings underscore the need for increased advocacy, better health facilities, enhanced educational training for healthcare providers include promoting healthy lifestyles, improving antenatal care, and conducting further research to better understand the risk factors associated with PIH. These measures could help reduce the incidence of PIH and improve maternal and fetal outcomes in the region.

Keywords: Pregnancy, Hypertension, Women, Risk Factors Public health.

Introduction

Pregnancy Induced Hypertension (PIH) occurs in pregnancy after 20 weeks of gestation in a woman with previously normal blood pressure. A systolic blood pressure of 140 or above and diastolic blood pressure of 90 mmHg, or both, is hypertension in pregnancy. Diagnosing hypertension disorder of pregnancy (HDP) requires taking two or more consecutive measurements with elevated systolic and diastolic blood pressure (Johnson *et al.*, 2020). The occurrence of maternal hypertensive disorders is found to have about 20.7 million in 2013 and about 10% of pregnancies globally are complicated resulting from pregnancy induced hypertension (Sharma *et al.*, 2016). PIH is a global problem and the most common medical problem requiring special attention in the intrapartum period (Shaman, 2010). According to the Health Ministry, hypertension during pregnancy, depending on the severity level, is considered a risk factor, which associated with individual characteristics, unfavorable socioeconomic conditions, certain obstetric histories and clinical problems could trigger harms to the maternal-fetal binomial. The Federal Ministry of Health has applied multi-pronged approaches to reducing maternal and newborn morbidity and mortality by improving access to and strengthening facility based maternal and newborn services but the maternal morbidity and mortality due to pregnancy induced hypertension was in an increasing trend (Ministry of Health 2014). Pregnancy-induced hypertension is a significant public health problem (World Health Organization 2011). It affects 2.73% of women

worldwide, particularly eclampsia, chronic hypertension, and preeclampsia, which affect 0.28%, 0.29%, and 2.16% of pregnant moms, respectively (Abalos *et al.*,2014).

Over 830 women's deaths every day in 2015 were reported because of problems associated with pregnancy and childbirth. The bulk of these deaths almost all occurred in low-resource nations, which could have been avoided (Alkema *et al.*,2020) Women with PIH are five times more likely to experience perinatal death compared to women without the condition (WHO 2011). One of the goals of the United Nations Sustainable Development Goal (SDG) is to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030 (United Nation 2018). The SDGs aim to uphold the momentum of the Millennium Development Goals (MDGs), which in its relentless effort catalyzed a global reduction in maternal deaths from approximately 390,000 in 1990 to 275,000 in 2015(Graham *et al.*,2016). Furthermore, the highest share of maternal death has been reported in Africa as compared to other regions. Maternal death due to pregnancy-related causes is 1 in 4,000 in Europe and 1 in 16 in African countries (Abdella, 2010). Likewise, the probability of a 15-year-old girl eventually dying from a maternal cause in Africa was as high as 1 in 37- as compared to 1 in 3400 in the European region (Mbouemboue *et al.*,2016)

Research Questions

1. What are the risk factors responsible for increasing incidence of pregnancy-induced hypertension among women in Ilorin West Local Government Kwara State?
2. Are the risk factors identified, significantly associated with pregnancy-induced hypertension among women in Ilorin West Local Government Kwara State?
3. What are the ways by which this study can reduce pregnancy-induced hypertension among women in Ilorin West Local Government?

General Objective

The purpose of this study is to determine associated risk factors of pregnancy-induced hypertension among pregnant women in Ilorin West Local Government Kwara State.

Specific Objective

1. To determine the risk factors responsible for increasing incidence of pregnancy-induced hypertension among women in Ilorin West Local Government.
2. To determine if the risk factors identified are significantly associated with pregnancy-induced hypertension in Ilorin West Local Government.
3. To find solutions on how the study will reduce pregnancy-induced hypertension in Ilorin West Local Government.

Research Hypotheses

H₀: there is no statistically significant relationship between associated risk factors and pregnancy-induced hypertension among women in Ilorin West Local Government.

H₁: there is statistically significant relationship between associated risk factors and pregnancy-induced hypertension among women in Ilorin West Local Government.

Methodology

Descriptive research design of the survey type was use for this study. It is deemed suitable because information is gathered by asking people questions on a specific topic and the data collection procedure is standardized and well defined. It involves qualitative survey through the administration of interviewer structured questionnaire to

determine risk factors associated with pregnancy-induced hypertension among women in Ilorin West Local Government Kwara State.

Ilorin West Local Government Area occupies a land area of 105km squared and according to National population census (NPC), this local government has a population of 364,666 at the 2006 census, making densest of all the local government is divided into twelve electoral wards (Adewole, Ajikobi, Alanamu, Badari, Baboko, Magaji- Ngeri, Ogidi, Oko-erin, Oloje, Ojuekun/Sarumi, Ubandawaki and Wara/Osin/Egbejila). (Oloko-Oba, *et al.*,2015) The population of this study will comprise of all pregnant women attending the primary health care centers in Ilorin west local Government Area, Kwara State Nigeria. The population of the pregnant women is sixteen thousand nine hundred and forty-two (16,942). (Department of Primary Health Care, Ilorin West Local Government Area,2024).

A multi-stage sampling technique was used to select the respondents for the study. **Stage one:** simple random sampling technique of fish bowl method was use to select the seven wards in Ilorin West Local Government, Kwara State. The names of all the wards was written on a sheet of paper, folded and put together in a bowl. An individual was asked to select the first seven wards for the study. **Stage two:** proportionate sampling technique was use to select five percent of the respondents from each of the wards for the study. **Stage three:** simple random sampling technique was use to select one hundred and fifty respondents out of two and seventy-two for the study.

Table 1: Sample size selected for the study

S/N	Name of wards	Population	5% sample	Proportionate
1.	Adewole	1,319	65.95	
2.	Ajikobi	613	30.65	
3.	Alanamu	320	16	
4.	Baboko	1,359	67.95	
5.	Badari	179	8.95	
6.	Magaji Ngeri	763	38.15	
7.	Oloje	883	44.15	
	TOTAL	5,436	272	

The sample size of a study is a section of the population that is drawn to make inference or projections to the general population. The sample size for this study is calculated using the fisher’s formula where the population is greater than 10,000 (Araoye, 2004).

$$n = \frac{Z^2 pq}{d^2}$$

where

n = the desired sample size when the population is greater than 10,000.

Z= the standard normal deviate.

p= proportion of population with the desired characteristics. 7.8% (Sajith M,2014)

q= proportion of population without the desired characteristics which is (1- p).

d= degree of accuracy desired, usually set at 5% or 0.05

$$= 1.96^2 \times 0.078(1 - 0.078)/0.05^2$$

$$= 3.84 \times 0.078(0.922)/0.0025$$

$$= 0.2760/0.0025$$

$$= 110.4$$

To compensate for non-response

$$nf = n/e$$

where, nf = *desired sample size*

n = *minimum required sample size*

e = *expected response rate at 90% or 0.9*

Therefore

$$= 110.4/0.9$$

$$= 122.7$$

To increase the precision and accuracy of this study, this sample size will be increased to 150.

The research instrument adopted for the study is a researcher designed structured questionnaire. It is used to gather information from the respondents on pregnancy induced hypertension and associated risk factors among pregnant women. To gain approval for the administration of the research instrument to the pregnant women in Ilorin west, letter of introduction duly signed by the Head, Department of Public Health, Al- Hikmah University is obtained. The letter was used for the purpose of data collection. The researcher demanded for the informed consent of all those who participated in the study, the researcher made it clear to the respondents that they are free to decide whatever information they wish to share.

Ethical approval was obtained from the Ethics Review Committee of Al-Hikmah University. At individual level, informed consent was received by each participant before data collection. A copy of the consent form is included in the appendix section. Respondents received a detailed description of the study. The researcher also made it known to the respondent that participation is optional, and information given will be private and confidential.

Results

Table1 Sociodemographic Data

Data	Variables	Frequency n = 150	Percent %
Age (yrs)	15 – 25	33	22.00
	26 – 35	86	57.33
	36 – 49	25	16.67
	50 above	6	4.00
Occupation	Self employed	89	59.33
	House wife	30	20.00
	Civil Servant	31	20.67
Religion	Islam	126	84.00
	Christianity	24	16.00
Marital Status	Single	7	4.67
	Married	140	93.33
	Widowed	1	0.67
	Separated	2	1.33
Educational Status	Primary	12	8.00
	Secondary	53	35.33
	First Degree	70	46.67
	Postgraduate	15	10.00
Residential 'Area	Urban	87	58.00
	Rural	63	42.00

No of Children	1 – 2	103	68.67
	3 – 4	37	24.67
	5 – 6	7	4.66
	7 above	3	2.00
Economic Status (₦)	50,000 – 99,000	116	77.33
	100,000 – 149,000	18	12.00
	150,000 above	16	10.67
Primigravida	Yes	50	33.33
	No	100	66.67
Have you ever been diagnosed with high blood pressure?	Yes	45	30.00
	No	105	70.00

Table 2 Response to questions related to Obesity

	Options	n=150	%
Do you believe that obesity increases the risk of pregnancy induced hypertension?	Yes	115	76.67
	No	35	23.33
Have you gained excessive weight during your current pregnancy?	Yes	80	53.33
	No	70	46.67
Do you believe that maintaining a healthy weight can prevent pregnancy induced hypertension?	Yes	128	85.33
	No	22	14.67
Do you know that obesity during pregnancy can increase the risk of various health problem in the baby like cognitive problem and developmental delay?	Yes	94	62.67
	No	56	37.33

Table 3 Response to questions related to Maternal age

	Options	n=150	%
Do you have believed that advanced maternal age increases the risk of pregnancy induced hypertension?	Yes	114	76.00
	No	36	24.00
Is pregnancy-induced hypertension common among pregnant aged women?	Yes	106	70.67
	No	44	29.33
Does maternal age have effect on pregnant women?	Yes	113	75.33
	No	37	24.67
Do you think a pregnant young woman is at a lesser risk of having pregnancy induced hypertension?	Yes	98	65.33
	No	52	34.67

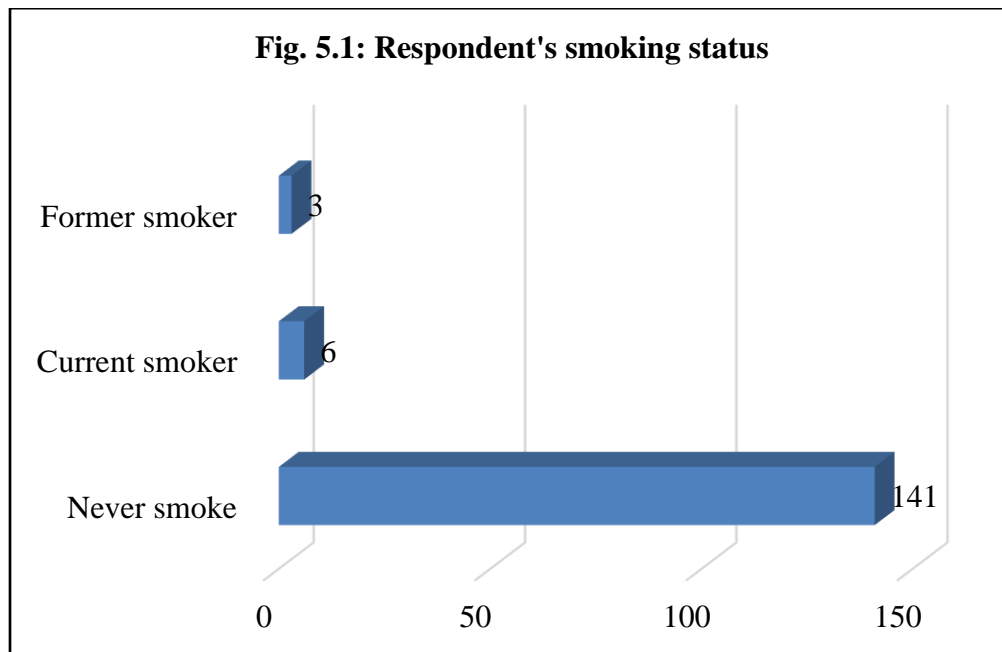
Table 4 Response to questions related to Family history

	Options	n=150	%
Do you have a family history of hypertension?	Yes	79	52.67
	No	71	47.33
Is there a common symptoms or trait to make	Yes	44	29.33

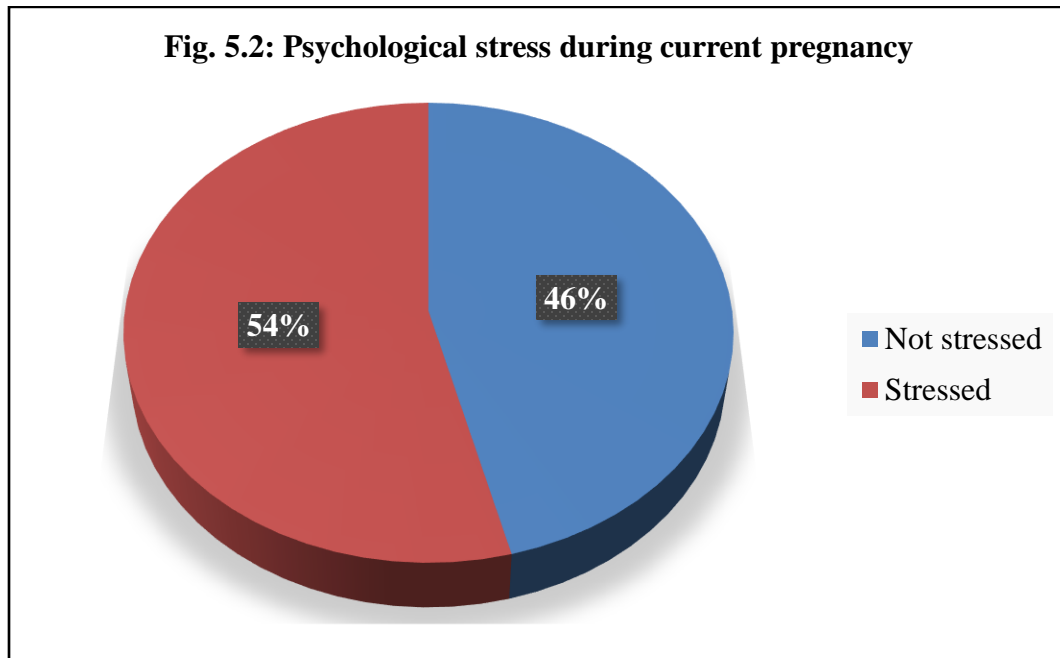
you deduce that you have pregnancy induced hypertension in your family?	No	106	70.67
Have you experience any symptoms of pregnancy induced hypertension such as high blood pressure?	Yes	42	28.00
	No	108	72.00
Are there preventive measures being taken by family members in relation to pregnancy induced hypertension?	Yes	55	36.67
	No	95	63.33

Table 5 Response to questions related to Lifestyle

	Options	n=150	%
Do you have history of smoking cigarette?	Yes	13	8.67
	No	137	91.33
Do you consume Alcohol during pregnancy?	Yes	9	6.00
	No	141	94.00
Do you perform physical exercise during current pregnancy?	Yes	129	86.00
	No	21	14.00
Do you consume fruits and vegetables?	Yes	144	96.00
	No	6	4.00



Relating to the risk of induced hypertension during pregnancy which may arise from respondents' lifestyle both social and mental, figure 4.1 reveals that majority of the respondents representing 94% of the total sample has never smoke cigarette or any other related vices while 6 (4%) and 3 (2%) claimed to be a current smoker and former smoker respectively.



Psychological stress as a factor related to the risk of pregnancy - induced high blood pressure as revealed in the above figure, majority of the respondents representing 54% protested that they are mostly stressed during pregnancy while 46% claimed not to be stressed.

Discussion

Obesity is one of the crucial risk factors associated with induced high blood pressure among pregnant women. Majority of the respondents representing 76.67% believes that obesity can increase the risk of pregnancy – induced hypertension while thirty-five (23.33%) respondents disclaimed that obesity has no association with pregnancy – induced hypertension. These outcomes are in similar to the study conducted in Indonesia by Anita *et al.* (2021) in which pregnant women suffering from diabetes or related health risk such as obesity are more likely to develop gestational hypertension than pregnant women without diabetes or obese. In similarity, Bryson *et al.* (2003) clarified that overweightness and high blood glucose is significantly associated with hypertension syndromes during pregnancy. Eighty (53.33%) respondents gained excessive weight during pregnancy while seventy (46.67%) said they do not gain excessive weight. Almost all the respondents representing 85.33% believes that maintaining a healthy weight can prevent pregnancy – induced hypertension while 14.67% disbelieved. Referring to Jensen *et al.* (2000) in the outcome of his research, that women at their reproductive age with gestational high blood glucose (diabetes) has a significant relationship with higher incidence of pregnant women with induced – hypertension. The research conducted by Luan *et al.*, 2010 also supported that diabetes and hypertension share the same pathways which may result to having a similar effect. Majority of the respondents (94) representing 62.67% proved to be aware that obesity during pregnancy can increase the risk of various health problem in the baby like cognitive problem and developmental delay during pregnancy and after birth while 56 (37.33%) claimed to have no idea about this concept.

Regression analysis in this study to confirm the association between sociodemographic factors and risk from obesity indicates that $p > 0.05$ with a statistical F-value greater than 0.05 computed at 95% confidence interval with a lower – upper bound value of -3.524 – 3.996. This indication confirmed that sociodemographic factors including respondent age, marital status, religion, economic status and educational status has significant association with the

risk factor that may influence induced hypertension during pregnancy among women. This result is similar to the study of Anita *et al.*, (2021) whereby pregnant women who had hypertension before their pregnancy had a higher risk of developing hypertension during pregnancy. Regarding maternal age which is also a cogent risk factor for pregnancy – induced hypertension. Table 3 revealed that most of the respondents representing 76% believed that advance maternal age can lead to increased risk of pregnancy – induced hypertension while 36 (24%) believed that there is no association between maternal age and risk emanating to pregnancy – induced hypertension. One hundred and six of the respondents representing 70.67% attested that induced hypertension during pregnancy is mostly common among aged women and that this risk – maternal age has a relative effect on pregnant women. Minority of the respondents representing 29.33% and 24.67% respectively believes that pregnancy – induced hypertension can occur to any woman in their reproductive age and that maternal age can as well has no effect towards the risk associated to induced hypertension. Comparable result was reported by Sing *et al.*, (2015) on risk factors associated with pregnancy – induced hypertension among two hundred and sixteen pregnant women attending antenatal care service. It was observed that maternal age above 35 years were more likely to be significantly associated with pregnancy – induced hypertension. The association between sociodemographic factors and risk that may emanate from maternal age. The regression analysis indicates that $p > 0.05$ with a statistical F-value of 0.814 computed at 95% confidence interval implying that maternal age is significantly related to the risk associated with exposure to pregnancy – induced high blood pressure among pregnant woman.

By and large, this study has indicated there is significant association between family history and risk associated with pregnancy–induced hypertension. This significant relationship is similar in the study conducted in Saudi Arabia by Salma *et al.* 2022 and in Nigeria whereby family history of hypertension was increasing the risk for the growth of pregnancy – induced hypertension which designates a positive connection to this infirmity.

Conclusion

Considering the outstanding facts analyzed in this study, it is evident that the risk factors associated with induced hypertension in pregnant women involves pre-conception hypertension, social background, high blood glucose, family history of hypertension as well as marital age the age at which the woman get pregnant. Evidence based, this study has substantiated that obesity can increase the risk of pregnancy induced hypertension and that most of them usually gained excessive weight during pregnancy. Regression analysis ($p>0.05$) established that sociodemographic factors including respondent age, marital status, religion, economic status and educational status has significant association with the risk factor that may influence induced hypertension during pregnancy among women. -It can also be deduced that induced hypertension during pregnancy is mostly common among aged women and that this risk maternal age has a relative effect on pregnant women and that advance maternal age can lead to increased risk of pregnancy – induced hypertension. A statistical analysis ($p>0.05$) at 95% confidence interval authenticated that maternal age is significantly related to the risk associated with exposure to pregnancy – induced high blood pressure among pregnant woman. It is also evident that there is significant association between the family history of the pregnant woman with the lifestyle of the mother and the probability of being perpetrated with induced hypertension during and after pregnancy.

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