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PREVALENCE OF HYPERTENSION AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING GISENYI DISTRICT HOSPITAL, RWANDA

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ABSTRACT

Hypertensive disorders of pregnancy (HDP) are multisystem disorders unique to human pregnancy and represent one of the most common problems of pregnancy and lead to increased maternal and perinatal morbidity and mortality. This study seeks to determine the proportion of hypertension disorders and associated factors among pregnant women attending Antenatal Care in Gisenyi District Hospital. It is a cross-sectional study only quantitative technique. The findings will add to the growing body of knowledge needed for non-communicable diseases control especially hypertension control by the Ministry of Health and Rwanda Biomedical Center (RBC). They will also be helpful in describing hypertensive disorders and associated factors while contributing towards its implementation against hypertension prevention and control programs. Furthermore, this study will provide baseline information regarding hypertension prevalence among pregnant mothers which may be used for further researchers. This study was targeting all pregnant women attending health centers of Gisenyi District Hospital zone. The total sample size is 305 pregnant women attending the services of antenatal care during the period of data collection. Simple random and systematic sampling techniques were used to select study participants. Bivariate analysis was used to establish factors associated with the rate of hypertensive disorders among pregnant women. However, PIH is still a little-understood entity, despite the enormous impact of its complications on maternal and fetal outcomes. The first objective guiding the study aimed at assessing knowledge level towards hypertensive disorders among pregnant women attending antenatal services of Rubavu district. The result on the demographic characteristics shows that the highest percentage of the respondents (40.7%) were aged between 25 and 30 years, majority were married (97.2%), most were (55.6%) attended secondary and the majority of respondents (55.6%) were Christian followers. The result of the study indicates that the prevalence of high blood pressure among pregnant women attending ANC services was 24.1%. Merchant pregnant women [AOR = 4.52; 95%CI = 1.09-18.82; p = 0.038], government/private employed women [AOR = 4.10; 95%CI = 1.13-14.90; p = 0.032], family history of hypertension [AOR = 4.00; 95%CI = 1.30-12.28; p = 0.016], history of asthma [AOR = 6.03; 95%CI = 1.35-26.89; p = 0.018] and women experienced severe headache w [AOR = 3.53; 95%CI = 1.06-11.75; p = 0.040] were independently associated with high blood pressure among pregnant women. The study concludes that the prevalence of high blood pressure among women attending antenatal clinic. Therefore, in order to reduce the prevalence of pregnancy-induced hypertension health stakeholders should incorporate comprehensive health

education on risk factors and prevention of hypertension in programs targeting women of childbearing age.

CHAPTER ONE: INTRODUCTION

Background of the study

Hypertensive disorders represent one of the most common problems of pregnancy and lead to increased maternal and perinatal morbidity and mortality. Hypertension may be pre-existent, may be induced by the pregnancy or both types may co-occur, and their influence on the outcome of the pregnancy is different depending on the type of disorder concerned (Sibai *et al*., 2011). Pre-existing hypertension or gestational hypertension can sometimes progress to preeclampsia which is high blood pressure that occurs in the second half of pregnancy, along with other problems, such as protein in the urine. Further, hypertension in the presence of proteinuria indicates more severe maternal and foetal consequences (Sibai *et al*., 2011).

Globally, it is the causes of nearly twelve percent of direct maternal deaths (Nour, 2011). Hypertensive disorder of pregnancy has remained a significant global public health threat in both developed and developing countries that contribute to maternal and perinatal morbidity and mortality. However, there are few studies in Rwanda, these have different objectives and study populations. Hence, this study can assess the proportion of hypertensive disorders and associated factors among pregnant women attending antenatal clinic of Rubavu district, Rwanda.

Statement of the Problem

Worldwide it is estimated that about 303 000 maternal deaths occurred in 2015 of which more than half of these deaths occurred in sub-Saharan Africa (WHO, 2015). Of these deaths, hypertensive disorders were the second cause at 14.0% and it complicates to eclampsia 14 times more as compared to developed countries (Say *et al*., 2014).

Hypertension disorder among pregnant women is an important public health problem in Rwanda regarding the report from Kigali University Teaching Hospital (CHUK) shows the causes of maternal mortality in hospital such as abortion complications, ante partum and postpartum hemorrhage, postpartum sepsis, eclampsia, and ruptured uterus.

The difference was the order of magnitude of the burden that each cause contributed (CHUK, 2016). From the report, abortion complications were the leading cause of maternal death (31%) while eclampsia contributed 12% of maternal deaths. From the medical records results, eclampsia (24%) was the leading cause of maternal mortality (CHUK, 2016).

However, this study will seek to determine the prevalence of hypertensive disorders and associated factors among pregnant women attending antenatal clinic of Rubavu district, Rwanda, the highest prevalent of birth rate (420-500 deliveries per month) in the country compared to other district hospitals in Rwanda and also due to the magnitude of maternal deaths (17/100,000 live births) from eclampsia, which is a complication of preeclampsia (RBC, 2016). Therefore, the main reason to conduct this study in Rubavu district is that district presented both high birth rate and maternal mortality rate as shown above, so as to inform public health intervention.

General Objective

To determine the occurrence of high blood pressure and associated factors among pregnant women attending antenatal services of Rubavu district, Rwanda.

Specific Objectives

a. To determine the occurrence of high blood pressure (hypertension) among pregnant women attending antenatal services
b. To establish socio-demographic factors associated with high blood pressure among pregnant women attending antenatal services
c. To assess association between clinical related factors and high blood pressure among pregnant women attending antenatal services

CHAPTER TWO: REVIEW OF RELATED LITERATURE

Theoretical framework

The Theoretical framework of this study will be Health Belief Model (Rosenstock and Stretcher, 2002). The Health Belief Model is beneficial in the assessment of health protection or disease prevention behavior. It addresses an individual's perception of the threat and seriousness posed by a health problem, perception of the usefulness of a behavior in decreasing the risk or threat of the disease and an individual's perception of the obstacles to adopting the new behavior (Rosenstock *et al*., 2000).

As applied to the study, the model will be used to assess the level of awareness of PHD among pregnant women and their health seeking attitude to avert the symptoms health prevention behaviors. It is important for individuals to understand the importance and meaning of knowledge of PHD and its complication so that they can make a rational and appropriate care seeking behavior concerning PHD. The components of the Health belief model are perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, cues to action, modifying factors and likelihood of action. This study will be focus on perceived seriousness, perceived benefits, perceived barriers and likelihood to take action.

The perceived seriousness refers to perceived severity of a health condition linked to an individual's knowledge about the condition and its possible consequences. In this study

perceived seriousness will be the seriousness with which the pregnant women would view the preceding signs and symptoms of PHD complications, like eclampsia, continuous frontal or occipital headache, epigastric/abdominal pain, confusion, nausea, vomiting reduced fetal movement, reduced urine output, and blurred vision. Implications of the severity range from an emotional response to concerns regarding possible restrictions affecting self, employment, family life and social relations.

The perceived benefits or preventive action refers to how various beneficial alternatives are believed to be feasible, acceptable and or desirable. These are the person's beliefs about the availability and effectiveness of various sources of health care and not the objective facts about the effectiveness of action determine what course of action one will take. In addition, the norms and pressures of social groups influence individual's behavior on seeking care.

In this study the perceived benefits of using any of the sources of health care provision by the pregnant women will be a desire to feel well, prevent fatal complications, convulsion, delivered before baby dies, be examined by a doctor or nurse given correct treatment, their pregnancy prolonged and to allow the baby to grow. Cues to action (the likelihood that the person will take any action) is influenced by the perceived benefits of the action weighed against barriers to acting, examples of barriers are costs, inconvenience, unpleasantness or how much change it requires. In this study likelihood that the person will take any action is the likelihood that the pregnant women with pregnant induced complications will report for professional treatment. Barriers to acting in this study are costs of the treatment at the hospital, cultural beliefs values and attitudes towards the hospital, hospital staff and the quality of care (Fadare *et al*., 2016).

Conceptual Framework

The conceptual framework shows the relationship between independent and dependent variables. It shows the variables that influence the occurrence of hypertension among pregnant women attending antenatal care services.

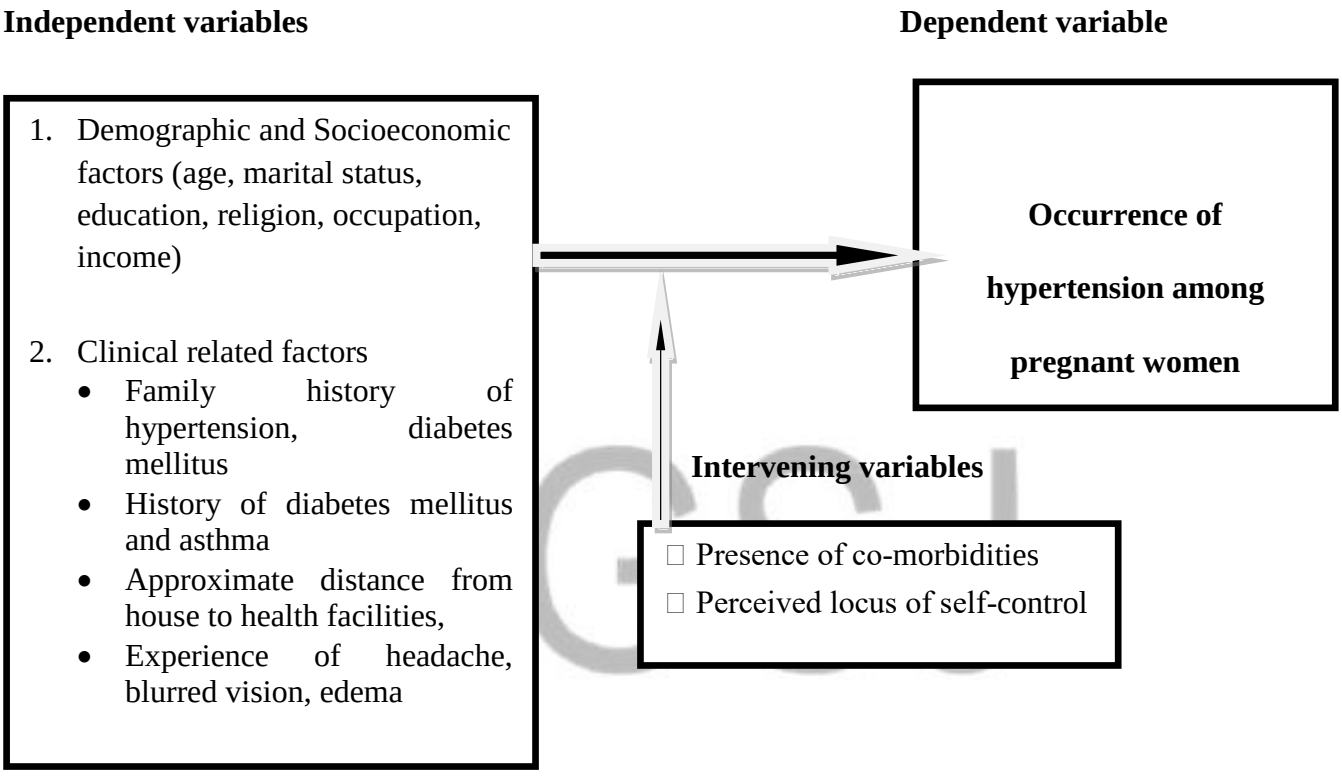

Figure 2.1: Conceptual framework

CHAPTER THREE: RESEARCH METHODOLOGY

Research Design

A cross-sectional study was employed using quantitative data collection approach.

Target Population

This study targeted all pregnant women attending health center of Gisenyi District Hospital zone. It is composed of thirteen (13) health centers, and it serves 450 to 500 pregnant women per months (GDH report, 2016).

Sample Size determination

The population of pregnant women with hypertension is less than 10,000 (GDH report, 2017) thus the Cochran (1963) formula was used and a P of 0.36 was used as the prevalence of hypertension in Rwanda is 36% (RBC, 2017). To determine the sample size as shown below;

$$n = \frac{(Z^2)\, p\,(1-p)}{d^2}$$

Where:

z = standard normal deviate set at 1.96 z-score corresponding to 95% confidence level

q = 1-p =1-0.36=0.64

d = Level of significance. This value at 95% confidence level given as 0.05

$$n = \frac{(1.96)\,(1.96)\,0.36\,(1-0.36)}{(0.05)\,(0.05)}$$

n= 305

Therefore, the total sample size is 305 pregnant women attending the services of antenatal care during the period of data collection. Therefore, the sample size for the current study was 305 study participants from 13 Health centers (HC) and one hospital of Rubavu district. By referring to calculated sample, to determine the respondents from each health facility, proportional to size formula was used and the sample size are shown in table 3.1 below:

$$n_i = \frac{n \times n_j}{N}$$

n_i = Sample size from each health facility.

n = over all sample size (305)

n_j = Number of pregnant women from each HC.

N= Target population (475)

Sampling Technique

In the quantitative study, a total of 305 pregnant women were sampled from all health facilities of Rubavu district based on proportionate sample and using systematic sampling. The first

respondent was selected randomly from the first two coming for services on each antenatal care clinic day by writing 'yes' and 'no' on a separate piece of paper. Thereafter, every other patient that meets the selection criteria was selected. The systematic sampling method was used in enrolling the study population with an Interval of i= 475/305, =1, 5 (around 2).

Data Collection Methods

Data Collection Instrument

A pre-tested structured questionnaire was used for quantitative data collection (Appendix 2). The questionnaire was administered by health staff members of the hospital other than those who were working in antenatal services of Rubavu district. To ensure the quality of data collection, data collectors were trained prior to data collection. The questionnaire was consisted of background and biographical information, proportion of pregnant hypertension and factors associated with that proportion.

Data analysis procedure

The data were entered into EPI data and transported into SPSS version 20 for analysis. Descriptive statistics were used to tabulate and describe the data and then inferential statistics Chi-square and multiple logistic regression analysis were used to establish factors associated with the prevalence of hypertensive disorders among pregnant women.

Inference was made using a 95% confidence interval and a p-value < 0.05. The results are presented in frequency, cross tabulation tables, and graph forms.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

Socio-demographic characteristics of respondents

Table 4.1: Socio-demographic characteristics of the respondents

Attributes	n	%
Age in years		
19-24	15	13.9
25 - 30	44	40.7

30-34	35	32.4
35 and above	14	13.0
Marital status		
Single	3	2.8
Married	105	97.2
Education level		
Primary school	37	34.3
Secondary school	60	55.6
University	11	10.2
Religion		
Christian	60	55.6
Muslim and others	48	44.4
Occupation		
House wife	51	47.2
Merchant	20	18.5
Government/private employee	37	34.3
Monthly income (n=101)		
<50,000 Frw	60	59.4
50,000-100,000 Frw	20	19.8
100,001-150,000	21	20.8

Primary data (Researcher, 2022)

As indicated in the Table 4.1, the highest percentage of the study respondents (40.7%) were aged between 25 and 30 years. Almost all the pregnant women were married (97.2%). In terms of level of education, majority (55.6%) attended secondary school while (10.2%) attended tertiary level of education. The majority of respondents (55.6%) were Christian and about half (47.2%) were housewives. Regarding income of the household, most of pregnant mothers (59.4%) were having monthly income less than 50,000 RWF.

Presentation of the findings

Objective one. Occurrence of hypertensive disorders among pregnant women attending antenatal services

The first objective was to determine the occurrence of high blood pressure (hypertension) among pregnant mothers attending antenatal care services determined by diagnosis of blood pressure measurement and the result is presented in Figure 4.1 below.

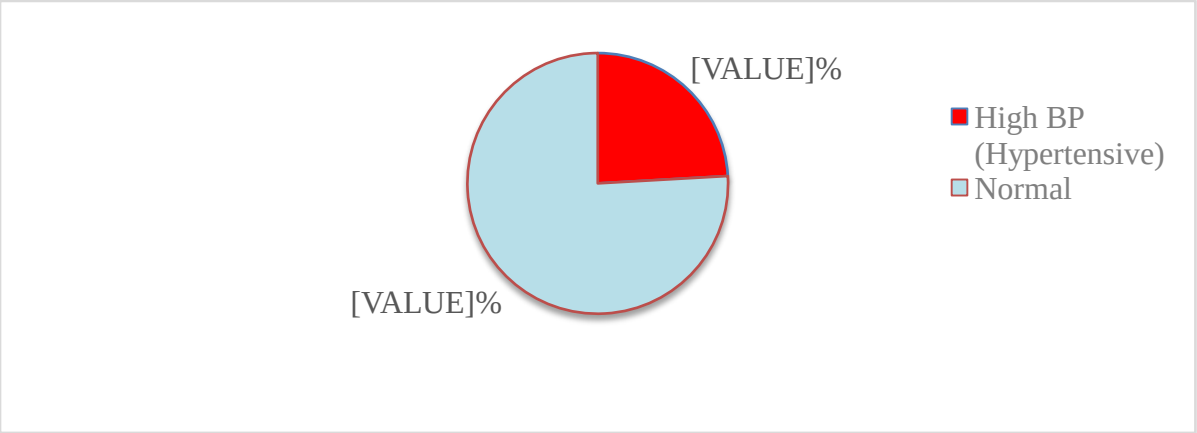

Figure 4.1 Occurrence of high blood pressure among pregnant women attending antenatal services

Source: Primary data (Researcher, 2022)

Objective two: To establish socio-demographic factors associated with high blood pressure among pregnant women attending antenatal services

Table 4.3: Association between socio-demographic characteristics and high blood pressure

Variables	High BP		Normal BP		χ^2 value	p value
	n	%	n	%		
Age in years						
19-24	3	20.0	12	80.0	8.29	**0.040**
25 - 30	6	13.6	38	86.4		
30-34	10	28.6	25	71.4		
35 and above	7	50.0	7	50.0		
Marital status						
Single	0	0.0	3	100.0	0.98	0.323
Married	26	24.8	79	75.2		
Education level						
Primary school	3	8.1	34	91.9	9.06	**0.011**
Secondary school	18	30.0	42	70.0		
University	5	45.5	6	54.5		
Religion						
Christian	15	25.0	45	75.0	0.06	0.801
Muslim and others	11	22.9	37	77.1		
Occupation						
House wife	6	11.8	45	88.2	8.42	**0.015**
Merchant	8	40.0	12	60.0		
Government/private employee	12	32.4	25	67.6		
Monthly income						
<50,000 RWF	19	31.7	41	68.3	5.20	0.074

50,000-100,000 RWF	2	10.0	18	90.0
100,001-150,000 RWF	3	14.3	18	85.7

Source: Research (2022)

As indicated in Table 4.3 above, age, level of education and occupation were significantly associated with high blood pressure. High blood pressure was significantly higher among older women compared to younger women (p value = 0.040). The proportion of high blood pressure was more among pregnant women who attended tertiary level of education compared to those attended primary school (p value = 0.011). Housewives were significantly lower to have high blood pressure compared to those who are working (p value = 0.015).

Objective three: To assess association between clinical related factors and high blood pressure among pregnant women attending antenatal services

Table 4.4: Clinical related factors associated with high blood pressure

Variables	High BP		Normal BP		χ^2 value	p value
	n	%	n	%		
Family history of hypertension						
Yes	14	50.0	14	50.0	13.90	**0.000**
No	12	15.0	68	85.0		
Family history of diabetes mellitus						
Yes	8	61.5	5	38.5	11.35	**0.001**
No	18	18.9	77	81.1		
History of diabetes mellitus						
Yes	1	50.0	1	50.0	0.75	0.387
No	25	23.6	81	76.4		
History of asthma						
Yes	9	69.2	4	30.8	16.49	**0.000**
No	17	17.9	78	82.1		
Approximate distance from house to health facilities						
30 minutes or less	11	26.2	31	73.8	1.37	0.504
30 minutes- 1 hour	12	26.7	33	73.3		
More than one hour	3	14.3	18	85.7		
Severe headache						
Yes	10	47.6	11	52.4	7.91	**0.005**
No	16	18.4	71	81.6		
Inability to see clearly (blurred vision)						
Yes	8	44.4	10	55.6	4.90	**0.027**
No	18	20.0	72	80.0		

Swelling of the face						
Yes	11	44.0	14	56.0	7.07	**0.008**
No	15	18.1	68	81.9		
Swelling of the hands						
Yes	11	42.3	15	57.7	6.23	**0.013**
No	15	18.3	67	81.7		

Source: Research (2022)

As shown in Table 4.4, the statistical significant associated factors with high blood pressure were family history of hypertension (p value <0.001), family history of diabetes mellitus (p value = 0.001), history of asthma (p value <0.001), severe headache (p value = 0.005), inability to see clearly (blurred vision) (p value =0.027), swelling of the face (p value = 0.008) and swelling of the hands (p value =0.013).

Summary

The prevalence of high blood pressure among pregnant women attending antenatal clinic at Gisenyi Hospital was relatively high at 24.1% .As indicated, research findings showed that Age, level of education and employment status were significantly associated with high blood pressure among pregnant women where older women, those with tertiary education, and those in employment were more likely to experience high blood pressure than their counterparts. Thus, the clinical factors associated with high blood pressure were family history of hypertension, family history of diabetes mellitus, history of asthma, severe headache, blurred vision, swelling of the face and swelling of the hands.

Conclusions

The aim of this study was to determine the occurrence of high blood pressure and associated factors among pregnant women attending antenatal services at Gisenyi Hospital. The study concludes that the prevalence of high blood pressure among women attending antenatal clinic in Gisenyi Hospital was relatively high and this poses potential complications for these women during the pregnancy, delivery and post-delivery period. The study also concludes that there

exist several socio-demographic and clinical factors that are associated with occurrence of high blood pressure during pregnancy, and that some of these factors can be modified or taken into account to reduce the risk of high blood pressure and related complications to the pregnant women.

Recommendations

MOH should devise ways of reducing the prevalence of pregnancy-induced hypertension by incorporating comprehensive health education on risk factors and prevention of hypertension in programs targeting women of childbearing age.

MINEDUC and other social services to implement programs targeting formal education to enable girls enroll in school and progress to higher levels of education because lower level of education is linked to negative health outcomes during pregnancy such as hypertension.

Hospitals and health centers to be equipped to be able to monitor more closely women genetically predisposed to pregnancy-induced high blood pressure and also those with advanced age and history of chronic disease.