AWARENESS, INCIDENCE, AND DETERMINANTS OF PREECLAMPSIA AMONG ANTENATAL WOMEN IN RURAL KISORO DISTRICT, UGANDA: A PROSPECTIVE COHORT STUDY

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Abstract

Preeclampsia remains a significant contributor to maternal morbidity and mortality, particularly in low-resource settings. This study assessed the awareness, incidence, and determinants of preeclampsia among pregnant women in rural Kisoro District, Uganda. A prospective cohort study design was employed. Data were collected from a cluster sample of 132 pregnant women attending antenatal clinics at three public owned primary health facilities in Kisoro. The data were analysed using descriptive and relative risk (RR) inferential statistics at 5% significance level and 95% confidence interval (CI). The study revealed inadequate awareness of preeclampsia (3.0%). The incidence rate of preeclampsia was observed to be 31.1%. Family history of hypertension increased the risk of having preeclampsia by 70% (RR: 1.7 (95% CI: 1.0-2.8); p = 0.03). In conclusion, the awareness of preeclampsia is inadequate, the burden is palpable, and the condition is determined by a family history of hypertension among pregnant women. Strict surveillance on pregnant women with family history of hypertension and more community enlightenment led by midwives are recommended.

Keywords: *Awareness, Determinants, Incidence, Preeclampsia, Pregnancy.*

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Introduction

Hypertensive disorders of pregnancy are a global public health challenge, with preeclampsia standing out as prevalent. Preeclampsia is clinically defined as a sustained increase in systolic blood pressure to ≥140 mmHg and/or diastolic pressure to ≥90 mmHg, occurring after the 20th week of pregnancy accompanied with protein in urine (Ayele et al., 2022). Preeclampsia contributes to about 15% of maternal morbidity and mortality worldwide (Chang et al., 2023). The global burden disproportionately impacts pregnant women in low-resource settings. In Sub-Saharan African, the incidence has grown to about 13% among pregnant women (Jikamo et al., 2023).

The aetiology of preeclampsia is multi-factorial. Theoretically, the risk factors or determinants may include: nulliparity, multiple pregnancies, a history of chronic hypertension, previous preeclampsia, gestational diabetes, and obesity (Kassa et al., 2023). Despite this knowledge, a critical barrier to the effective prevention and timely management of the condition in many regions of Sub-Saharan Africa is a profound lack of awareness among the at-risk population. Many pregnant women are unaware of preeclampsia, and some hold misconceptions about its causes, attributing symptoms to superstitions and witchcraft (Nabulo et al., 2021). This may lead to the use of inappropriate and ineffective alternative treatments, and delaying essential medical care (Ahmed et al., 2021).

In Uganda, preeclampsia affects approximately 15% of pregnant women and is responsible for about 50% of the nation's maternal mortality (Nabulo et al., 2021). Once gestational hypertension manifests, it can rapidly lead to damage of vital maternal organs and death (Reddy et al., 2021). Addressing the scourge is fundamental to achieving the targets of Sustainable Development Goals 3, which emphasizes the improvement of maternal health (Macassa, 2021).

In Western Uganda (specifically in the rural Kisoro District), there is a dearth of research exploring community awareness, incidence, and risk factors of preeclampsia (Omar et al., 2025). This prospective cohort study aimed to fill this knowledge gap by assessing the awareness, determining the incidence, and identifying the determinants of preeclampsia among antenatal women in the rural Kisoro District of Uganda. The findings are expected to inform targeted interventions.

Methods

The ethical approval for this study was obtained from the University of Port Harcourt Ethics Review Board. The study adhered to the guidelines of the Helsinki Declaration revised in 2013. Administrative permissions were obtained from the health facility management. Informed consent was obtained from each study participant before data collection.

This study adopted a prospective cohort design. The study was conducted in three rural public owned primary health centres in Kisoro District, South-Western Uganda: Kisoro Health Centre, Rubuguri Health Centre IV, and Buhozi Health Centre III. The research population comprised all registered 756 pregnant women aged 18–49 years, in the second trimester (20-24 weeks gestation), who were receiving antenatal care services at the health facilities.

A sample size of 153 was determined for this study using the Cochran's formula (Bolarinwa, 2020) for finite population and after increasing the sample by 10% for fallout or non-response. Cluster sampling method was applied. Kisoro District was divided into three geographical clusters, one comprehensive primary healthcare facility was identified in each cluster, and the pregnant women in each identified facility were randomly selected for the study. The study included pregnant women who were resident in the community, confirmed as pregnant by an attending obstetrician, and at 20-24 weeks gestation at the commencement of the study. Women with twin pregnancies, mental health challenges, below 18 years old, and above 49 years old were excluded.

A structured questionnaire was used for data collection on awareness of preeclampsia at baseline (20-24 weeks) gestation and a structured checklist was used for follow-up data collection every four weeks to assess preeclampsia status until term. The structured questionnaire and checklist were validated by a 5-man expert panel who were professors of public health and a 0.91 expert agreement index (content validity index) was achieved.

The eligible pregnant women were approached, enrolled, and the purpose of the study was clearly

explained to them. Written informed consent was obtained from the each enrolled participant. After giving each participant a unique code number for follow-up purposes, data collection began with the administration of the questionnaire to capture basic socio-demographic information (marital status, parity, and gestational age) and assess their awareness of preeclampsia. Follow-up was done every four weeks using the checklist to collect data on blood pressure, blood glucose, protein in urine, and preeclampsia status as indicated by the attending obstetrician. The study lasted 10 months, from September 2024 to July 2025.

Collected data were summarised with descriptive statistical tools: frequency and percentage. Test of associations between categorical variables were done with the use of relative risk inferential statistics at 5% significance level and 95% confidence. The analyses of data were done with the aid of Statistical Product and Service Solutions Version 21. Results were presented in tables and a figure (bar chart). The figure and tables were created using Microsoft Excel 2007.

Results

Out of the enrolled 153 participants, 132 completed the study. The retention rate was 86.3%. The 21 individuals were lost to follow-up at 32–36 weeks gestation. All 132 pregnant women delivered in the selected facilities.

Table 1: Socio-demographic profile of the participants, n = 132.

Variable	f	%
Marital status		
Single	17	12.9
Married	115	87.1
Parity		
Nullipara	10	7.6
Primipara	55	41.7
Multipara	67	50.8
Gestational age		
20 weeks	45	34.1
21 weeks	19	14.4
22 weeks	32	24.2
23 weeks	36	27.3
Family history of hypertension		
No	99	75.0
Yes	33	25.0

%=percent, f=frequency

Table 1 presents the socio-demographic profile of the study participants and showed that majority of the participants were married (87.1%), multiparous (50.8%), and at 20 weeks gestation (34.1%) at baseline.

Table 2: Awareness of preeclampsia among the participants at baseline, n = 132.

Variable	Response	f	%
Have you heard about preeclampsia?	No	7	5.3
	Yes	125	94.7
What is preeclampsia?	High blood sugar during pregnancy	23	17.4
	I do not know	105	79.6
	High BP during pregnancy	4	3.0
Where should one with preeclampsia seek help?	Herbalist	63	47.8
	Pastor	37	28.0
	Health centre	32	24.2

%=percentage, f=frequency, BP= Blood pressure

Table 2 summarizes the participants' awareness of preeclampsia and indicated that there was inadequate awareness of preeclampsia among the participants. Although most (94.7%) have heard about preeclampsia, very few (3.0%) knew exactly what it is, and less than half (47.7%) were aware that it can be treated in the health centre.

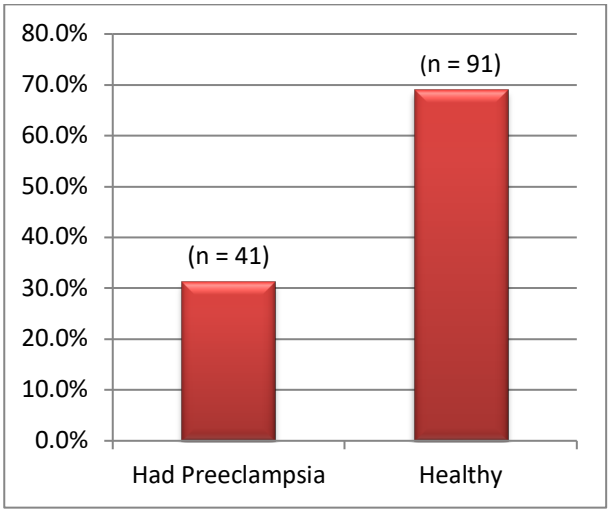

Figure 1: Incidence of preeclampsia among participants on follow-up, n = 132.

Figure 1 presents information on the incidence of preeclampsia among the study participants on follow-up and showed that 31.1% of the participants developed preeclampsia evidenced by

having both gestational hypertension and protein in urine

Table 3: Determinants of preeclampsia among the participants, n = 132.

Variable	Pre eclampsia, n = 41	Healthy, n = 91	RR (95%CI)	p value
Parity				
Parous	39	83	1.5(0.4-5.6)	0.46
Nullipara	2	8		
Family history of hypertension				
Yes	15	18	1.7(1.0-2.8)	0.03
No	26	73		
Gestational Diabetes				
Present	4	3	1.9(0.9-3.8)	0.06
Not present	37	88		

RR=relative risk, n=frequency, CI= confidence interval

Table 3 summarises the determinants of preeclampsia among the participants and indicated that family history of hypertension increased the risk of preeclampsia by 70% (95% CI: 1.0-2.8; p = 0.03). Parity and gestational diabetes were not significantly associated with incidence of preeclampsia.

Discussion

This study found inadequate awareness of preeclampsia (3.0%). This finding suggests that more enlightenment interventions are needed regarding community awareness of preeclampsia. This result contrasts the findings of Abate et al. (2025), who reported 51% awareness of preeclampsia among antenatal women in Ethiopia. The finding also contradicts Shrateh et al. (2025), who reported found that 60.6% of pregnant women were well aware of preeclampsia in Palestine. The discrepancy in finding could be because Abate et al. (2025) and Shrateh et al. (2025) assessed a cross-section of pregnant women in their third trimester. It is possible that as the women attend antenatal clinics in Nigeria and Ethiopia, the healthcare providers teach about gestational hypertension and preeclampsia.

This study observed an incidence rate of 31.1% for preeclampsia. The findings indicate a palpable preeclampsia burden in Kisoro District, South-Western Uganda. This finding was higher than the 4% reported by Awor et al (2022) in a study conducted in Northern Uganda. The discrepancy in findings may be because Awor et al (2022) examined pregnant women in only one facility in Lacor as opposed to the multi-facility design applied in this present study. More so, this finding was higher than the pooled incidence of 13% for Sub-Saharan Africa reported in Jikamo et al. (2023). This hints the scale of preeclampsia burden in Kisoro District, South-Western Uganda.

This study found that family history of hypertension increased the likelihood of having preeclampsia by seventy percent. This finding means that pregnant women whose parents or biological siblings had hypertension could develop preeclampsia. The finding indicates a potential genetic susceptibility to preeclampsia. This finding corroborates Hu et al. (2025), who reported a significant association between family hypertension and the occurrence of preeclampsia in a randomised controlled trial in the United Kingdom. This finding further supported Aduloju et al. (2025), who observed that a family history of hypertension increased the propensity for preeclampsia in pregnant women in Nigeria. This finding suggests that pregnant women with a family history of hypertension need more rigorous antenatal surveillance.

Conclusion

There is inadequate awareness of preeclampsia among pregnant women. The incidence of preeclampsia is obvious and is determined by a family history of hypertension. This study recommends more frequent community enlightenment programs on preeclampsia by midwives. Additionally, midwives should maintain rigorous surveillance on pregnant women with family history of hypertension.

Conflict of interest:
The authors declare no conflict of interest.

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