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Evaluating Midwives' Knowledge and Attitudes Regarding Pre-Eclampsia Management at Presbyterian Hospital

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ABSTRACT

Background: Pre-eclampsia is a major contributor to maternal and perinatal morbidity and mortality globally and in Ghana. Midwives play a critical role in the early detection and management; however, their knowledge, attitudes, and the challenges they encounter influence the quality of care. Methodology/Principal Findings: A descriptive cross-sectional study was conducted among 50 midwives using a structured self-administered questionnaire. Data were analyzed using SPSS version 26. Descriptive statistics summarized demographic characteristics, knowledge, attitudes, barriers, and recommendations. Chi-square tests and logistic regression examined associations between demographic variables and knowledge/attitude levels. The majority of respondents were aged 20–39 years (70.0%), with 54.0% having 1–3 years of experience, and 86.0% had received prior training in pre-eclampsia management. Knowledge was generally high, with 88.0% recognizing hallmark symptoms and 84.0% identifying magnesium sulfate as the first-line anticonvulsant. Attitudes were positive; 68.0% strongly agreed that pre-eclampsia training should be mandatory. Key barriers included limited patient awareness (86.0%), understaffing (70.0%), and inadequate diagnostic tools (58.0%). Years of experience were significantly associated with knowledge level (chi-square = 19.470, p=0.003), while logistic regression showed work unit as a significant predictor of knowledge level (p = 0.037).

Conclusion: Midwives exhibited good knowledge and positive attitudes toward pre-eclampsia

Index Terms: Pre-eclampsia (PE) • Midwives • Knowledge • Attitudes • Barriers • Ghana

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RESEARCH ARTICLE

Evaluating Midwives' Knowledge and Attitudes Regarding Pre-Eclampsia Management at Presbyterian Hospital

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Abstract

Background: Pre-eclampsia is a major contributor to maternal and perinatal morbidity and mortality globally and in Ghana. Midwives play a critical role in the early detection and management; however, their knowledge, attitudes, and the challenges they encounter influence the quality of care. Methodology/Principal Findings: A descriptive cross-sectional study was conducted among 50 midwives using a structured self-administered questionnaire. Data were analyzed using SPSS version 26. Descriptive statistics summarized demographic characteristics, knowledge, attitudes, barriers, and recommendations. Chi-square tests and logistic regression examined associations between demographic variables and knowledge/attitude levels. The majority of respondents were aged 20–39 years (70.0%), with 54.0% having 1–3 years of experience, and 86.0% had received prior training in pre-eclampsia management. Knowledge was generally high, with 88.0% recognizing hallmark symptoms and 84.0% identifying magnesium sulfate as the first-line anticonvulsant. Attitudes were positive; 68.0% strongly agreed that pre-eclampsia training should be mandatory. Key barriers included limited patient awareness (86.0%), understaffing (70.0%), and inadequate diagnostic tools (58.0%). Years of experience were significantly associated with knowledge level (chi-square = 19.470, p=0.003), while logistic regression showed work unit as a significant predictor of knowledge level (p = 0.037).

Conclusion: Midwives exhibited good knowledge and positive attitudes toward pre-eclampsia management, though systemic barriers constrain effective care. Strengthening in-service training, improving diagnostic and therapeutic resources, and enhancing patient education are recommended to optimize outcomes.

Keywords: *Pre-eclampsia (PE), Midwives, Knowledge, Attitudes, Barriers, Ghana*

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1 Introduction

Pre-eclampsia is a leading cause of adverse maternal and perinatal outcomes worldwide, contributing significantly to global maternal and neonatal morbidity and mortality. The condition affects approximately 2%–8% of pregnancies and is responsible for 14% of maternal deaths and 12% of perinatal mortality globally [1] [2] [3] [4] [5]. Pre-eclampsia (PE) is characterized by new-onset hypertension after 20 weeks of gestation, typically accompanied by proteinuria, maternal organ dysfunction, or uteroplacental insufficiency [6]. Globally, the pathogenesis of PE is strongly linked to abnormal trophoblastic invasion of the uterine spiral arteries during placental development, resulting in placental ischemia, oxidative stress, and systemic endothelial dysfunction [7] [8] [9]. These disruptions contribute to the disease's complex multisystemic nature. PE remains more prevalent in low- and middle-income countries (LMICs), with rates seven times higher than in developed countries [10]. In Africa, prevalence rates range from 1.8% to 16.7% [11] [12], with Ghana reporting prevalence between 6.55% and 7.3% [13] [14]. The higher prevalence in LMICs is influenced by socio-economic disparities, limited access to healthcare, and a range of risk factors, including early pregnancies, multiparity, advanced maternal age, anemia, and infections [15]. In Ghana, PE is a major contributor to maternal and neonatal mortality, with approximately 25% of maternal deaths attributed to hypertensive disorders in tertiary hospitals [16] [17]. Although clinical guidelines have been adopted, systemic challenges such as delayed diagnoses, inconsistent adherence to protocols, and insufficient training of healthcare workers continue to hinder effective management of PE [18] [19]. Midwives have played and continue to play a critical role in the early detection and management of PE, especially in LMICs, where they often serve as the first point of contact for pregnant women. In Ghana, midwives operate at all levels of the healthcare system, offering a range of services including antenatal care, blood pressure monitoring, administration of antihypertensive medications, and referral of high-risk cases [20] [21]. However, evidence suggests many midwives demonstrate inadequate knowledge and skills in managing pre-eclampsia [22] [23] [24]. A study revealed that only 50% of midwives in Ghana's secondary and primary health facilities demonstrated competency in managing pregnancy complications [25]. Ghana has made significant strides in increasing the midwifery workforce as part of its commitment to achieving universal health coverage (UHC). However, this increase in numbers has not necessarily resulted in improved quality of care, particularly in rural and underserved areas where PE-related complications remain prevalent [26] [27]. Although continuing professional development (CPD) programs are available for midwives, these initiatives remain

inconsistently implemented, and gaps in pre-service training persist [26] [28] [29]. PE outcomes could be significantly improved with targeted training interventions that align with global guidelines. A well-trained cadre of midwives equipped with the knowledge, skills, and confidence to manage PE is essential for reducing maternal and neonatal mortality rates in Ghana. This study aimed to assess midwives' knowledge and attitudes at Presbyterian Hospital, Agogo, toward PE management to identify critical gaps and inform evidence-based recommendations for improving midwifery care.

2 Materials and Methods

2.1 Ethics Statement

The Research Committee, Presbyterian Hospital, Agogo, approved the study (APH/ADM/RES135/25)

2.2 Study Design and Location

This study adopted a descriptive cross-sectional design to assess interventions aimed at improving midwives' knowledge and attitudes toward PE management. This design was appropriate for obtaining a snapshot of midwives' current knowledge, attitudes, and challenges in pre-eclampsia care, enabling identification of gaps and areas for improvement. This study was conducted at the Presbyterian Hospital, Agogo, located in the Ashanti Region of Ghana. Established on March 21, 1931, the hospital has grown to become a major healthcare institution, recognized as the second largest hospital in the Ashanti Region and a referral centre for various healthcare facilities, including Konongo-Odumase Government Hospital and Juaso Government Hospital. Although officially designated as a district hospital, its size, scope of operations, and range of specialized services position it as a facility of regional hospital status. The hospital offers specialized care in surgery, ophthalmology, paediatrics, internal medicine, and obstetrics and gynaecology, making it a critical healthcare provider in the region. It also attracts patients from across Ghana and internationally, establishing itself as a leading mission hospital in the country. Given its stature as a referral and specialized care centre, Presbyterian Hospital, Asante Akyem Agogo, provided an ideal setting for this study, as its midwifery workforce manages a significant number of cases involving pregnancy complications, including pre-eclampsia.

2.3 Inclusion and Exclusion Criteria

Registered midwives actively providing antenatal, intrapartum, or postpartum care at Presbyterian Hospital, Agogo were included in the study. Midwives with a minimum of six months of clinical experience at the hospital were included in the study. Midwives willing to provide informed consent to participate were included in the study. Midwives unavailable during the data collection period were excluded from the study. Midwives in administrative roles with no direct patient care responsibilities were excluded from the study. A total of 50 midwives were included in the research.

2.4 Sample Size

A purposive sampling technique was employed to select midwives who are directly involved in antenatal, intrapartum, or postpartum care at the hospital. The sample size was determined using the Cochran formula:

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

where: n = required sample size, Z = Z-score for a 95% confidence interval (1.96) p = estimated proportion of midwives with adequate knowledge of pre-eclampsia (assumed at 50% for maximum variability) and e = margin of error (5%). A 10% adjustment was made to account for non-responses, yielding a final sample size of 50 midwives.

2.5 Data Collection

A structured questionnaire was used to assess midwives' knowledge, attitudes, and practices related to pre-eclampsia. The questionnaire included sections on: Knowledge of pre-eclampsia risk factors, symptoms, and management, Attitudes toward the condition and its management, barriers and challenges in managing pre-eclampsia, and recommendations to help in the management of pre-eclampsia.

2.6 Procedure

Data was collected through face-to-face interviews and self-administered questionnaires. To enhance accuracy and completeness, a brief orientation was provided to participants before they completed the questionnaire.

3 Data Analysis

Data analysis was conducted using Statistical Package for Social Sciences (SPSS) Version 26.0. Frequencies, and percentages was used to summarize demographic characteristics, levels of knowledge, and attitudes. Chi-square tests was used to examine associations between selected demographic variables (training in pre-eclampsia management, level of education, years of experience) and knowledge or attitude. Logistic regression was further used to identify predictors of adequate knowledge and positive attitudes. A p-value of 0.05 was considered statistically significant.

4 Results

The results were organized into socio-demographic characteristics, knowledge levels, attitudes, perceived barriers, and recommendations. Inferential statistics, including chi-square tests and logistic regression, were also presented to assess associations and predictors. The majority of respondents (70.0%) were aged between 20 and 29 years, followed by 22.0% in the 30–39 years group. Only a small proportion were aged 40 years and above. In terms of years of professional experience, the largest proportion (54.0%) had 1–3 years of experience, while 28.0% had less than one year. Only 18.0% had more than four years of experience. Educational background revealed that nearly half (46.0%) of respondents held a Diploma qualification, while 40.0% had a Bachelor's degree, and only 4.0% had postgraduate training. Encouragingly, a majority (86.0%) reported having received training in pre-eclampsia management. Table 1 below presents the socio-demographic profile of 50 respondents who participated in the study.

4.1 Knowledge of Pre-eclampsia

Respondents were assessed on their knowledge of pre-eclampsia using structured questions covering definition, risk factors, hallmark symptoms, complications, treatment, and monitoring. The results are summarized in Tables 2–8 and illustrated in Figures 1–2.

All respondents (100%) correctly identified pre-eclampsia as a condition characterized by high blood pressure after 20 weeks of pregnancy, often with proteinuria or maternal organ dysfunction. Table 2 below shows participants' responses to the definition of pre-eclampsia.

Recognition of risk factors was varied: Chronic hypertension (90%), History of pre-eclampsia in a previous pregnancy (82%), Advanced maternal age> 35years (68%), and Multiple pregnancies (62%) were frequently selected. Nulliparity (first pregnancy) was the least identified (28%). Table 3 below shows participant response to the recognition of the risk factors of Pre-eclampsia

Table 1. Socio-Demographic Characteristics of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Age Group	20-29	35	70.0
	30-39	11	22.0
	40-49	3	6.0
	50+	1	2.0
Years of Experience	<1 year	14	28.0
	1-3 years	27	54.0
	4-6 years	6	12.0
	>6 years	3	6.0
Educational Level	Certificate	5	10.0
	Diploma	23	46.0
	Bachelor's Degree	20	40.0
	Master's Degree or higher	2	4.0
Trained in Pre-eclampsia	Yes	43	86.0
	No	7	14.0
Work setting	ANC unit	19	38.0
	Labor & delivery unit	18	36.0
	PNC unit	3	6.0
	Rotates across all unit	10	20.0
Encounter with PE Cases	Rarely	5	10.0
	Occasionally	26	52.0
	Frequently	19	38.0
	Always	0	0.0
Total		**50**	**100**

Table 2. Definition of pre-eclampsia (Q7)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Q7	50	100.0	0	0.0

Table 3. Risk Factors of Pre-eclampsia (Q8a-Q8e)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Q8a	14	28.0	36	72.0
Q8b	31	62.0	19	38.0
Q8c	45	90.0	5	10.0
Q8d	34	68.0	16	32.0
Q8e	41	82.0	9	18.0

Table 4. Hallmark Symptoms (Q9a-Q9e)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Q9a	43	86.0	7	14.0
Q9b	37	74.0	13	26.0
Q9c	44	88.0	6	12.0
Q9d	45	90.0	5	10.0
Q9e	15	30.0	35	70.0

Most respondents correctly identified high blood pressure >140/90mmHg (90%), proteinuria (88%), persistent frontal headache despite intake of analgesia (86%) and vision changes (74%) as hallmark symptoms. However, only 30% recognized excessive weight gain unrelated to diet. Table 4 below shows participant response to the hallmark symptoms of Pre-eclampsia.

Nearly all respondents (98%) recognized eclampsia (seizures), and 74% identified preterm birth as complications. However, fewer identified placental abruption (46%), maternal stroke (46%), and fetal growth restriction (42%). Table 6 below shows participants' responses to the complications of untreated Pre-eclampsia.

A large majority (84%) identified magnesium sulfate as the first-line drug for preventing seizures in severe pre-eclampsia. However, 16% did not know. Table **??** below shows participant response to the first line treatment of Pre-eclampsia.

Most respondents (88%) correctly stated that pre-eclampsia typically develops after 20 weeks of gestation. However, 12% did not know. Table 7 below shows participant response to the gestational age Pre-eclampsia occurs.

A majority (86%) reported that blood pressure should be monitored at least every 4–6 hours in severe pre-eclampsia cases. However, 14%

Table 5. Complications of Untreated Pre-eclampsia (Q10a–Q10e)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Q10a	49	98.0	1	2.0
Q10b	21	42.0	29	58.0
Q10c	37	74.0	13	26.0
Q10d	23	46.0	27	54.0
Q10e	23	46.0	27	54.0

Table 6. Complications of Untreated Pre-eclampsia (Q10a–Q10e)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Q11	42	84.0	8	16.0

Table 7. First-line Treatment (Q11)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Q12	44	88.0	6	12.0

Table 8. Monitoring of Blood Pressure (Q13)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Q13	43	86.0	7	14.0

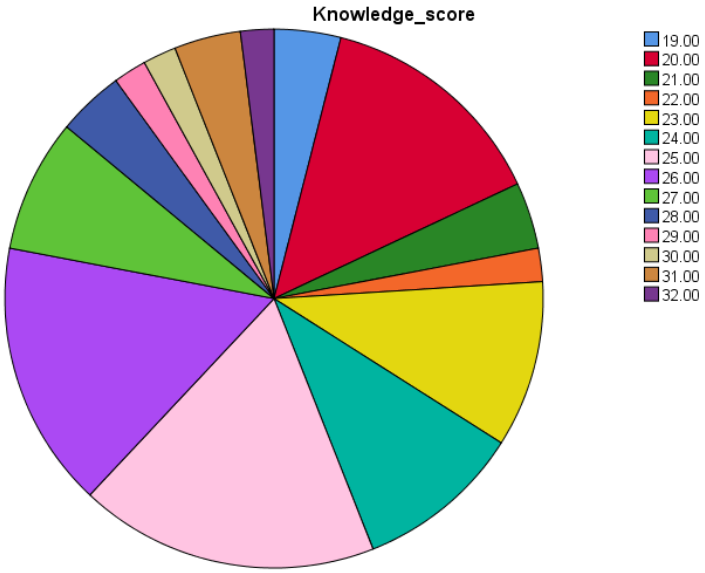

Figure 1. Pie chart showing distribution of Knowledge Scores

did not know. Table 8 below shows participant response to how blood pressure should be monitored in Pre-eclampsia.

4.1.1 Knowledge Scores. Knowledge scores ranged from 19 to 32 out of 32, with most respondents scoring ?24, classifying them as having adequate knowledge. Figure 1 below is a pie chart showing distribution of knowledge scores.

4.2 Attitudes Towards Managing Pre-eclampsia

More than half of respondents (52%) reported being very confident, while 36% were moderately confident, and a minority (12%) expressed low or no confidence. An overwhelming majority (94%) either agreed or strongly agreed that training in pre-eclampsia management should be mandatory. The majority of respondents felt prepared, with 54% strongly agreeing and 32% agreeing that they were ready to handle pre-eclampsia. Only 14% were neutral or negative. A majority (86%) agreed or strongly agreed that adequate training and resources are available, though 14% remained neutral or disagreed. Almost all respondents (94%) supported regular training, with 56% agreeing and 38% strongly agreeing. Table 9 shows participants' responses to their attitudes towards the management of Pre-eclampsia.

4.2.1 Attitude Scores. The was a high distribution of attitude scores. Figure 2 is a histogram showing the distribution of attitude score among respondents.

Table 9. Attitudes Toward Managing Pre-eclampsia (Q14-19)

Variable	Category	Frequency (n)	Percentage (%)
Confidence in Managing PE	Very confident	26	52.0
	Moderately confident	18	36.0
	Slightly confident	4	8.0
	Not confident	2	4.0
Mandatory PE MGT Training	Strongly disagree	3	6.0
	Disagree	0	0.0
	Neutral	0	0.0
	Agree	13	26.0
	Strongly agree	34	68.0
Preparedness	Strongly disagree	1	2.0
	Disagree	0	0.0
	Neutral	6	12.0
	Agree	16	32.0
	Strongly agree	27	54.0
Training & Resources	Strongly disagree	0	0.0
	Disagree	1	2.0
	Neutral	6	12.0
	Agree	27	54.0
	Strongly agree	16	32.0
Regular training Programs	Strongly disagree	2	4.0
	Disagree	0	0.0
	Neutral	1	2.0
	Agree	28	56.0
	Strongly agree	19	38.0
Institutional Support	Strongly disagree	0	0.0
	Disagree	0	0.0
	Neutral	3	6.0
	Agree	23	48.0
	Strongly agree	24	46.0
Total		**50**	**100**

Table 10. Barriers to Effective Management of Pre-eclampsia (Q20)

Barriers	Yes	n %	No	n %
Lack of training on pre-eclampsia management	29	58.0	21	42.0
Inadequate diagnostic tools (e.g., BP monitors, urine dipsticks)	29	58.0	21	42.0
Shortages of magnesium sulfate and other medications	28	56.0	22	44.0
Delayed access to laboratory investigations	37	74.0	13	26.0
Lack of locally adapted clinical guidelines	16	32.0	34	68.0
Delayed referral pathways for severe cases	35	70.0	15	30.0
Overwork or understaffing	35	70.0	15	30.0
Limited patient awareness of pre-eclampsia symptoms	43	86.0	7	14.0

4.3 Barriers to Effective Management of Pre-eclampsia

Respondents were assessed on the barriers and challenges they face, which hinder their ability to manage pre-eclampsia effectively. The results are summarized in Tables 10–13.

The majority of respondents reported limited patient awareness (86%), followed by delayed laboratory investigations (74%), overwork or understaffing (70%), and delayed referral pathways (70%). More than half also cited lack of training (58%), inadequate diagnostic tools (58%), shortages of magnesium sulfate (56%) and few reported lacks of locally adapted guidelines (32%). Table 10 below shows participants response to the barriers on the effective management of Pre-eclampsia.

Interestingly, all respondents (100%) confirmed the presence of clear facility protocols for managing pre-eclampsia. Table 11 below shows participants' responses to the presence of protocols for managing Pre-eclampsia.

Nearly half of respondents (46%) reported occasional shortages, while 20% frequently and 4% always encountered shortages of essential supplies. Only 30% said resource shortages were rare. Table 12 below shows participant response to resource shortage in pre-eclampsia management.

The most common challenges reported were limited patient awareness (26%) and insufficient diagnostic tools (24%), followed by insufficient beds (12%), refusal of magnesium sulfate due to fear/pain (12%), and staff overload (12%). A smaller proportion highlighted clinical monitoring difficulties (6%), delayed referrals/lab results (4%), and lack of competence/training (4%). Table 13 shows specific challenges participant face in the management of Pre-eclampsia.

4.4 Recommendations from Midwives

Respondents were asked to make recommendations. The results are summarized in Tables 14–16.

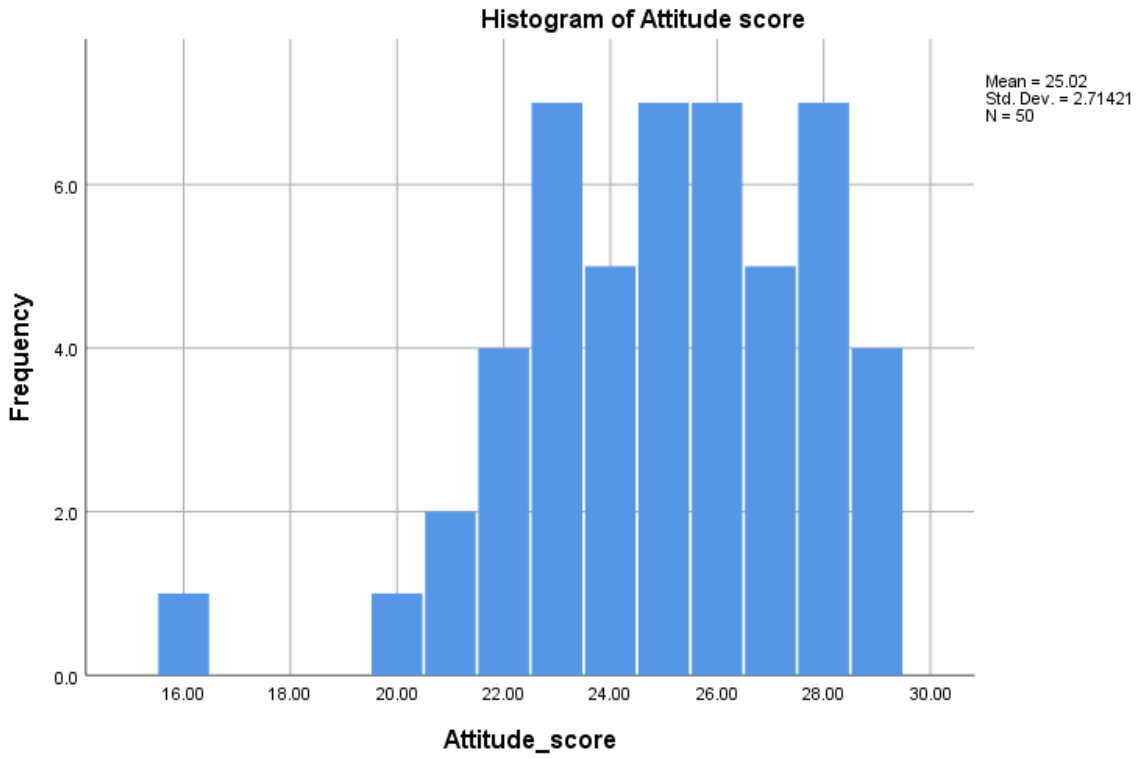

Figure 2. Histogram showing the distribution of Attitude score among Respondents

Table 11. Protocols for Managing Pre-eclampsia (Q21)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Q21	50	100.0	0	0.0

Table 12. Resource shortage in Pre-eclampsia Management (Q22)

Variable	Category	Frequency (n)	Percentage (%)
Resource shortage	Rarely	15	30.0
	Occasionally	23	46.0
	Frequently	10	20.0
	Always	2	4.0

Table 13. Specific Challenges Faced in Management (Q23)

Barriers	Frequency (n)	Percentage (%)
Limited patient awareness about pre-eclampsia	13	26.0
Insufficient diagnostic tools (BP apparatus, lab)	12	24.0
Insufficient beds	6	12.0
Refusal of $MgSO_4$ by clients (Pain, fear)	6	12.0
Staff work overload/Understaffing	6	12.0
Delayed referrals/lab results	2	4.0
Lack of training/Competence	2	4.0
Clinical challenges (Urine output, colour, BP control)	3	6.0

Table 14. Interventions to improve Pre-eclampsia Management (Q24)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Regular in-service training for midwives	48	96.0	2	4.0
Improved access to diagnostic tools and medications	47	94.0	3	6.0
Development of locally adapted clinical guidelines	41	82.0	9	18.0
Recruitment of additional midwives to reduce workload	39	78.0	11	22.0
Better patient education about pre-eclampsia symptoms	47	94.0	3	6.0

Table 15. Additional training programs on Pre-eclampsia Management (Q24)

Question	Selected (n)=50	Selected (%)	Not Selected (n)=50	Not Selected (%)
Yes	50	100.0	0	0.0
No	0	0.0	0	0.0

Table 16. Priority Recommendations to Effective Management of Pre-eclampsia (Q24)

Recommendations	Frequency (n)	Percentage (%)
Better patient education/awareness creation	27	54.0
Regular in-service training for midwives	17	34.0
Recruitment of more midwives/reduce workload	4	8.0
Adequate diagnostic tools and medical supplies	4	8.0
Development of locally adapted clinical guidelines	2	4.0
Encourage regular ANC attendance/early screening	3	6.0
Emergency preparedness/response	1	2.0

The majority of respondents recommended regular in-service training for midwives (96%), improved access to diagnostic tools and medications (94%), and better patient education on pre-eclampsia symptoms (94%). Additionally, 82% highlighted the development of locally adapted clinical guidelines, while 78% suggested the recruitment of additional midwives to reduce workload. Table 14 below shows participant response to interventions to improve pre-eclampsia management.

All respondents (100%) endorsed the need for additional training programs on pre-eclampsia management. Table 15 shows participant response on whether additional training programs are needed or not.

When asked to point out interventions that would make the biggest difference in pre-eclampsia management, more than half of respondents emphasized better patient education and awareness creation (54%), followed by regular in-service training (34%), while a smaller proportion highlighted recruitment of more midwives (8%), improved diagnostic tools and supplies (8%), locally adapted guidelines (4%), regular ANC attendance and early screening (6%), and emergency preparedness (2%). Table 16 shows participants' priority recommendations to effective management of pre-eclampsia.

4.5 Inferential Statistics

To examine the associations between selected socio-demographic variables and outcome variables (knowledge level and attitude level), both Chi-square tests of independence and binary logistic regression analyses were conducted.

4.5.1 Chi-Square Test Results. Chi-square tests were used to examine the associations between training in pre-eclampsia management, educational level, and years of experience with knowledge and attitude levels of respondents.

Of all variables tested, only years of professional experience was significantly associated with knowledge level. None of the socio-demographic variables showed significant associations with attitude levels. These results informed subsequent logistic regression analysis. Table 17 below shows summary of chi-square results.

4.6 Logistic Regression Analysis

4.6.1 Logistic Regression Analysis of Predictors of Knowledge. Work Unit was the only significant predictor of knowledge level ($p=0.037$). Midwives in ANC unit ($Exp(B)=516.6$, $p=0.004$) and Labor & Delivery unit ($Exp(B)=73.400$, $p=0.011$) had substantially higher odds of adequate knowledge compared to the reference group. Years of Experience was marginally non-significant ($p=0.077$). Educational level, training history, encounter rate, and age group were not significant predictors ($p> 0.05$). Table 18 shows findings of logistic regression predicting knowledge level.

4.6.2 Logistic Regression Analysis of Predictors of Attitude Level. None of the predictor variables were statistically significant (all $p> 0.05$). Training, work unit, years of experience, encounter rate, and age group, did not significantly predict attitude level. Table 19 shows findings of logistic regression predicting attitude level.

Table 17. Summary of Chi-square Results

Variable Tested	Outcome Variable	X^2 (Chi-square)	df	p-value	Significant
Trained in PE	Attitude Level	0.399	1	0.560	No
Education	Attitude Level	4.427	3	0.219	No
Experience	Attitude Level	5.357	1	0.147	No
Trained in PE	Knowledge Level	0.319	2	0.853	No
Education	Knowledge Level	8.101	6	0.231	No
Experience	Knowledge Level	19.470	6	0.003	Yes

Table 18. Logistic Regression Predicting Knowledge Level

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Experience	-1.622	0.918	3.122	1	0.077	0.197
Education (Overall)			2.458	3	0.483	
Education (1)	-4.945	49225.968	0.000	1	1.000	0.007
Education (2)	-3.245	49225.968	0.000	1	1.000	0.039
Education (3)	-5.182	49225.968	0.000	1	1.000	0.006
Trained PE (1)	0.874	1.718	0.259	1	0.611	2.396
Work Unit (Overall)			8.468	3	0.037	
Work Unit (1)	6.247	2.167	8.311	1	0.004	516.571
Work Unit (2)	4.296	1.698	6.403	1	0.011	73.400
Work Unit (3)	23.918	20632.024	0.000	1	0.999	24407852688.961
Encounter Rate	0.690	0.786	0.770	1	0.380	1.993
Age Group (Overall)			3.505	3	0.320	
Age Group (1)	-20.732	40192.957	0.000	1	1.000	0.000
Age Group (2)	-17.088	40192.957	0.000	1	1.000	0.000
Age Group (3)	-43.324	56841.321	0.000	1	0.999	0.000
Constant	22.061	63550.471	0.000	1	1.000	3811653902.426

Table 19. Logistic Regression Predicting Attitude Level

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Experience	34.037	7054.970	0.000	1	0.996	605524524306084.100
Education (Overall)			0.000	3	1.000	
Education (1)	32.958	51409.461	0.000	1	0.999	205826965598875.220
Education (2)	68.074	51208.424	0.000	1	0.999	3.667E+29
Education (3)	49.413	52349.640	0.000	1	0.999	2.882E+21
Trained PE (1)	-1.685	15646.873	0.000	1	1.000	0.185
Work Unit (Overall)			0.000	3	1.000	
Work Unit (1)	14.456	18912.710	0.000	1	0.999	1896486.409
Work Unit (2)	48.404	32884.130	0.000	1	0.999	1.051E+21
Work Unit (3)	-17.963	25461.309	0.000	1	0.999	0.000
Encounter Rate	0.000	1.500	0.000	1	1.000	1.000
Age Group (Overall)			0.000	3	1.000	
Age Group (1)	47.564	42597.743	0.000	1	0.999	4.539E+20
Age Group (2)	46.458	44909.833	0.000	1	0.999	1.501E+20
Age Group (3)	-18.573	58475.367	0.000	1	1.000	0.000
Constant	-143.092	81576.295	0.000	1	0.999	0.000

5 Discussion

The findings demonstrate that midwives at Presbyterian Hospital, Agogo generally possess good theoretical knowledge of pre-eclampsia. Universal recognition of the definition of pre-eclampsia, high awareness of its onset after 20 weeks of gestation and the need to monitor blood pressure at least every 4–6 hours in severe pre-eclampsia cases suggests strong foundational understanding of the condition. This level of knowledge exceeds findings reported from earlier studies in Ghana and other LMICs, where only about half of midwives demonstrated adequate knowledge of hypertensive disorders in pregnancy [25] [30].

High recognition of major risk factors such as chronic hypertension, previous history of pre-eclampsia, advanced maternal age and multiple gestations align with WHO and ISSHP guidelines and indicates effective transmission of core obstetric knowledge. However, poor identification of nulliparity as a risk factor highlights persistent gaps in comprehensive risk assessment. This finding is consistent with studies from South Africa that reported fragmented understanding of risk factors of pre-eclampsia [31]. Failure to recognize early risk factors may delay intensified surveillance during antenatal care, increasing the likelihood of adverse outcomes.

Knowledge of the hallmark symptoms such as hypertension, proteinuria, persistent headache, and visual disturbances was high, reflecting improved awareness of clinical warning signs. Nonetheless, limited recognition of non-specific symptoms such as unexplained excessive weight gain suggests that subtle early manifestations of pre-eclampsia may be overlooked. This is clinically significant, as early detection

remains central to preventing progression to severe disease [32] [33] [34].

Regarding complications, respondents demonstrated stronger awareness of maternal complications (eclampsia, preterm birth) than fetal complications such as fetal growth restriction and placental abruption. Failure to identify neonatal risks associated with pre-eclampsia can lead to severe adverse outcomes [32] [33]. This imbalance emphasizes the need to ensure a more balanced understanding of this risk factors to promote holistic maternal-fetal care.

Encouragingly, most respondents correctly identified magnesium sulfate as the first-line anticonvulsant, consistent with WHO recommendations. However, the minority who failed to recognize this remains concerning, as incorrect management of severe pre-eclampsia can result in preventable maternal mortality.

Overall, midwives demonstrated positive attitudes towards the management of pre-eclampsia. High levels of confidence and perceived preparedness indicate that midwives are psychologically willing to manage the condition. Similar positive attitudes have been reported in Bujumbura and Tanzania, although confidence levels vary across settings [35] [36].

An overwhelming majority supported mandatory and regular training, reflecting strong self-awareness of the need for continuous professional development. This aligns with evidence from Ghana showing that midwives prefer structured workshops and in-service training to maintain clinical competence [37] [38].

Although respondents largely reported institutional support and availability of resources, perceived adequacy may not reflect actual clinical realities. Systemic challenges such as inconsistent drug supply, malfunctioning equipment, and delayed investigations have been widely documented in Ghanaian hospitals [38] [39]. Therefore, confidence and positive attitudes may not always translate into effective practice if structural barriers persist.

Despite good knowledge and positive attitudes, respondents identified several significant systemic and patient-related barriers and challenges to effective pre-eclampsia management. Limited patient awareness emerged as the most frequently reported challenge. This finding support existing literature that highlights poor health literacy, sociocultural beliefs, and delayed care-seeking behaviors as major contributors to adverse maternal outcomes in LMICs [40] [41] [42].

Health system barriers, including delayed laboratory investigations, understaffing, inadequate diagnostic tools, and insufficient beds, were also prominent. These challenges have been repeatedly reported in Ghana and other sub-Saharan African countries and undermine the timely diagnosis and management of pre-eclampsia [39] [43]. Even when protocols exist, inadequate resources limit their effective implementation.

Work overload and understaffing further compound these challenges. High patient-to-midwife ratio increases stress, impairs clinical decision-making, and contributes to burnout, which may compromise quality of care [44] [45]. Additionally, patient refusal of magnesium sulfate due to fear or misconceptions highlights the need for improved patient counselling and community education.

Inferential analysis revealed that years of experience and work unit were significant predictors of knowledge level. This suggests that practical exposure, particularly in high-risk unit such as antenatal and labor wards, enhances clinical understanding of pre-eclampsia. These findings are consistent with earlier studies demonstrating that clinical experience improves competence in obstetric emergencies [19].

The lack of strong predictors for attitude level may indicate that attitudes are influenced more by professional values and institutional culture than by individual demographic factors.

6 Conclusion

Midwives at Presbyterian Hospital, Agogo demonstrated good knowledge and positive attitudes towards the management of pre-eclampsia, particularly in relation to diagnosis, monitoring and use of magnesium sulfate. However, gaps remain in recognizing some risk factors and fetal complications, while systemic barriers such as limited patient awareness, understaffing, delayed investigations, and inadequate resources continue to hinder effective care. Clinical experience and work unit significantly influenced knowledge levels, highlighting the importance of practical exposure. Overall, strengthening health systems through regular training, improved resources, and patient education is essential to optimize pre-eclampsia management and reduce preventable maternal and neonatal morbidity in Ghana.

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