

KNOWLEDGE AND PRACTICE OF MIDWIVES ON SCREENING OF PREECLAMPSIA DURING PRENATAL CARE IN SELECTED HEALTH FACILITIES OF SAMARICA, OCCIDENTAL MINDORO

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ABSTRACT

Preeclampsia continues to be a primary cause of maternal and neonatal morbidity worldwide. This study aims to assess the level of knowledge and practice of midwives on screening of preeclampsia during prenatal care, aiming to determine their demographic characteristics, level of knowledge on screening of preeclampsia, level of practices in screening of preeclampsia, and potential relationship between demographic profile and the level of knowledge and practice on screening of preeclampsia. A descriptive cross-sectional study was conducted to assess the knowledge and practices of midwives on screening of preeclampsia during prenatal care in SAMARICA District of Occidental Mindoro. The sample size was 74 midwives. Data were gathered through knowledge-based questionnaires aligned with ACOG and WHO and Maternal and Newborn Quality of Care Survey ANC Observation Checklist. The study revealed that while midwives correctly identified key indicators like hypertension (98.6%) and edema (94.6%), yet 70.3% had a low level of comprehensive knowledge, particularly about the danger signs and risk factors, this shows a lack of awareness regarding essential factors. Similarly, 52.7% demonstrated a low level of clinical practice. Additionally, while midwives checked for edema, only 21.6% followed correct blood pressure measurement and only 12.2% performed regular weighing. Additionally, demographic factors such as age, type of facility and years of experience showed no significant relationship with either knowledge and practice, moreover, statistical analysis confirmed that higher educational degree does not automatically lead to better adherence to screening protocols, while findings indicates that knowledge is the key driver to performance.

Keywords: *preeclampsia, prenatal care, midwife knowledge and practice, screening and SAMARICA*

SDG: *SDG 3- Good health and well-being*

INTRODUCTION

Pregnancy is one of the most important events in a woman's life, requiring essential care throughout all three trimesters to manage the many factors that can influence maternal and fetal health. During this stage, midwives must monitor pregnancies continuously and thoroughly to implement timely interventions for complications such as preeclampsia. Preeclampsia remains a leading contributor to maternal and neonatal mortality globally, characterized by high blood pressure (≥ 140 mmHg systolic or ≥ 90 mmHg diastolic) and proteinuria after 20 weeks of gestation (World Health Organization, 2025).

Globally, preeclampsia is a leading contributor to maternal and neonatal mortality. This condition accounts for an estimated 62,000 to 77,000 maternal deaths and approximately 500,000 infant deaths annually (World Health Organization, 2025).

The effects of preeclampsia in the Philippines are concerning. In accordance with the Philippine Statistics Authority (2025) it states that preeclampsia ranks as the second primary cause of maternal mortality in the MIMAROPA region represents 12.7% of all maternal fatalities. In this area, the Occidental Mindoro had the highest mortality rate, indicating 44.4% of all preeclampsia cases in the region. These numbers highlight an immediate requirement for enhanced screening, particularly in regions where medical access and resources are scarce.

Prenatal care is the primary approach to address issues associated with preeclampsia, which pertains to the healthcare services provided during pregnancy to guarantee optimal health outcomes results for both the mother and the growing fetus as it seeks to pinpoint any associated risk during pregnancy and start assessment processes for the health of both mother and fetus (Karrar et al., 2025). Midwives play a crucial role in addressing these challenges as they serve as primary healthcare providers in the community. They are tasked with thorough evaluations of medical histories, blood pressure measurement, weighing of clients and screening for proteinuria. Additionally, midwives have a broadened responsibility in handling preeclampsia in relation to the Basic Emergency Obstetrics and Newborn Care, which involves the use of essential medications such as magnesium sulfate (Department of Health, 2010). Nevertheless, rising mortality rates are frequently associated with the provider-related issues, including overlooked diagnoses and inadequate treatment (Gonzaga et al., 2024).

Moreover, research has shown that numerous midwives do not possess adequate knowledge or clinical competencies related to screening for preeclampsia. Midwives lack sufficient knowledge or clinical skills specific to

preeclampsia screening. 49% of the midwives have sufficient knowledge in this domain. Insufficient knowledge and practice may result in undetected diagnosis of the condition [Seif and Rashid, 2022]. Midwives often encounter a lack of understanding regarding the risk indicators, clinical signs and proper monitoring techniques. Furthermore, diagnostic tool limitations, such as inadequate screening tools in the facilities, further impede their capacity to adhere to the treatment guidelines [Escobar et al., 2024]. To ensure quality, woman-centered care, there is a clear necessity for continuous professional development and practical training workshops [Garti et al., 2021].

This research, therefore, aims to determine the current knowledge and practice of midwives in the screening of preeclampsia to identify gaps and provide a foundation for targeted training programs to improve maternal and neonatal care.

METHOD

Research Design

The research design utilized in this study was descriptive cross-sectional design, a quantitative study. The study assessed the level of knowledge and practice among midwives on screening of preeclampsia during prenatal care in selected facilities of San Jose and Magsaysay and Rizal and Calintaan (SAMARICA), Occidental Mindoro.

Study Site

The study was conducted in the selected health facilities of San Jose, Magsaysay, Rizal, Calintaan, Occidental Mindoro. Facilities included in this study were those health facilities with midwives who rendered prenatal care services. The study was conducted during the Second Semester, A.Y 2025-2026. The researchers conducted a data gathering in healthcare facilities, starting from Calintaan, then Rizal, San Jose, and Magsaysay.

Sample

Collectively 74 midwives were involved in the study sample. The participants were chosen according to specific criteria to ensure the relevance and reliability of data collected. Midwives were eligible if they held a valid Professional Regulation Commission (PRC) license, were currently employed in either government or private health facilities in Rizal, Magsaysay, Calintaan and San Jose, Occidental Mindoro, and had experience in providing prenatal care. All participants must give their informed consent before being included in the study. The exclusion criteria included in this study were midwives who met the inclusion criteria but exhibited specific conditions requiring their exclusion from the study. This includes midwives who refused to participate as respondents during the research period and those who were not physically present during the data collection period.

Research Instrument

The data collection tool used was a structured questionnaire composed of three main parts: a demographic profile, a knowledge assessment and a practice-based checklist. The sociodemographic questionnaire was composed of: age, sex, respondent's educational attainment (Diploma in Midwifery and Bachelor of Science in Midwifery); type of facility (barangay health station and maternity and lying in clinic); and years of experience. To assess the level of knowledge of midwives on identifying for preeclampsia during prenatal care, knowledge-based questionnaires were utilized wherein it was aligned with the clinical indicators established in the American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin No. 222 [2020] which supersedes Bulletin No. 202 and the World Health Organization (WHO) guidelines for hypertensive disorders in pregnancy. To evaluate the practice of midwives in screening of preeclampsia during prenatal care, a Maternal and Newborn Quality of Care Survey ANC Observation Checklist was used. It was a standardized data collection tool that was adapted for each country to gather information on ANC services. This integration ensured that evaluating midwives' knowledge and skills aligned with the latest international standards for diagnostic criteria. This includes updated blood pressure threshold and proteinuria- independent definitions of preeclampsia.

Data Collection

Following approval from the Municipal Mayors and Municipal Health Officers, data collection was conducted in the municipalities of San Jose, Magsaysay, Rizal, and Calintaan (SAMARICA), Occidental Mindoro. Lists of licensed midwives and their assigned facilities were obtained through the respective Municipal Health Offices. Eligible participants included licensed midwives providing prenatal care services in Rural Health Units (RHUs), birthing facilities, and Barangay Health Stations. Researchers contacted potential participants to explain the study and confirm their willingness to participate. Data collection was conducted at the participants assigned facilities after obtaining written informed consent. A structured bilingual (Tagalog and English) questionnaire was administered to assess midwives' knowledge, while an observation checklist was used to evaluate their prenatal care competencies. Both instruments underwent review to ensure clarity, relevance, and cultural appropriateness. Interviews and observations were conducted onsite to facilitate participant convenience and preserve the natural practice setting. Completed questionnaires and checklists were reviewed for

completeness and accuracy immediately after data collection. To maintain confidentiality, unique codes were assigned to participants, and no identifying information was included in the dataset. All completed forms were securely stored and accessible only to the research team. Data were encoded in Microsoft Excel for analysis, while physical records will be retained for three years following study completion and subsequently destroyed through secure disposal procedures.

Ethical Consideration

The Prior to data collection, all participants were provided with a cover letter explaining the study's objectives, significance, procedures, risks, and benefits. Participation was entirely voluntary, and informed consent was obtained before enrollment. Participants were informed of their right to decline participation or withdraw from the study at any time without penalty or adverse consequences to their employment, professional standing, or access to services. Confidentiality and anonymity were strictly maintained by restricting data access to the research team and securely storing all records. Participants were informed that study findings would be made available upon request. The research adhered to established ethical principles of respect for persons, beneficence, and justice. All collected data will be securely disposed of after the completion of the study and dissemination of findings.

Data Analysis

Descriptive statistics including frequencies and percentages, were utilized to provide a summary of the demographic characteristics of the participating midwives and to describe their levels of knowledge and practice in screening preeclampsia during prenatal care. Demographic variables such as age, educational attainment, years of experience, and type of facility were treated as ordinal variables. Levels of knowledge and practice were categorized as low and average and analyzed as ordered outcomes. Due to the highly skewed distribution of knowledge and practice scores, nonparametric statistical tests were employed. Spearman's rho correlation coefficient was used to determine the relationship between demographic characteristics and the levels of knowledge and practice of midwives. This nonparametric test was deemed appropriate due to the ordinal nature of the variables, the limited number of response categories, and the non-normal distribution of the data. Conducted at a 0.05 level of significance using two-tailed tests.

RESULTS

The data revealed female workforce with a significant majority are female (97.3%), with the largest age group falling between 25 and 34 years old (36.5%). Educationally, more than half of the midwives (58.1%) have attained a Bachelor of Science in Midwifery with a workforce (50%) of more than 10 years of professional experience working in practice within government-run (83.8%) Barangay Health Stations or Rural Health Units [table 1].

Table 1. Demographic characteristics (n=74).

Profile	Frequency	Percentage
Age		
18-24	4	5.4
25-34	27	36.5
35-44	21	28.4
45-54	22	29.7
Sex		
Male	2	2.7
Female	72	97.3
Educational attainment		
Diploma in Midwifery	31	41.9
Bachelor of Science in Midwifery	43	58.1
Type of facility		
Birthing centers (Private)	9	12.2
Barangay Health Stations/ Rural Health Units	62	83.8
BEmONC	3	4.1
Years of experience		
<5 years	16	21.6
6-10 years	21	28.4
More than 10 years	37	50.0

Level of knowledge on screening of preeclampsia

The overall knowledge of the midwives possesses a "Low" level of comprehensive knowledge (70.3%) regarding preeclampsia screening [table 2].

Table 2. Level of knowledge of midwives on screening of preeclampsia.

Risk Factors	Response Category	Frequency	Percentage
High blood pressure	Yes	73	98.6
	No	1	1.4
Multiple pregnancies	Yes	22	29.7
	No	52	70.3
Parity	Yes	9	12.2
	No	65	87.8
BMI $\geq$ 30 kg	Yes	21	28.4
	No	53	71.6
Convulsions	Yes	18	24.3
	No	56	75.7
Knowledge on risk factors	High	19	25.7
	Low	55	74.3
Hypertension	Yes	74	100.0
	No	0	0
Edema	Yes	70	94.6
	No	4	5.4
Proteinuria	Yes	49	66.2
	No	25	33.8
Rapid weight gain	Yes	20	27.0
	No	54	73.0
Severe headache	Yes	30	40.5
	No	44	59.5
Nausea/vomiting	Yes	12	91.9
	No	68	8.1
Knowledge on signs and symptoms	High	29	39.2
	Low	45	60.8
Blurred vision/visual disturbance	Yes	49	66.2
	No	25	33.8
Convulsions or loss of consciousness	Yes	49	66.2
	No	25	33.8
Swollen face or hands	Yes	60	81.1
	No	14	18.9
Shortness of breath	Yes	15	20.3
	No	59	79.7
Severe, persistent headache	Yes	26	35.1
	No	48	64.9
Severe abdominal pain	Yes	11	14.9
	No	63	85.1
Frequent or painful urination	Yes	4	5.4
	No	70	94.6
Knowledge on danger signs	High	11	14.9
	Low	63	85.1
Level of knowledge	High	22	29.7
	Low	52	70.3

Observed level of practices of midwives on screening of preeclampsia

The table showed 100% of the midwives performed physical examinations for edema, other vital screening protocols were frequently neglected. Only 12.2% of midwives weighed their clients during the prenatal visit, and a low 21.6% followed the correct clinical procedure for blood pressure measurement, resulting in 52.7% of the respondents being categorized as having a "Low" level of clinical practices [table 3].

Table 3. Observed level of practices of midwives on screening of preeclampsia.

Practices	Response Category	Frequency	Percentage
The midwife weighs the client during the visit.	Done	9	12.2
	Not done	65	87.8
BP reading was taken on the left/right arm, using the appropriate cuff, with the arm supported at heart level.	Done	16	21.6
	Not done	58	78.4
The midwife examined the hands, face, and ankles for the presence of edema.	Done	74	100
	Not done	0	0
Level of practice	High	35	47.3
	Low	39	52.7

Relationship between the demographic characteristics of midwives, and their level of knowledge and practice

Demographic factors such as age, type of facility, and years of experience showed no significant relationship with either knowledge or practice. However, educational attainment showed a significant negative correlation with practice ($\rho = -0.238$, $p < 0.05$), suggesting that higher degrees did not automatically lead to better adherence to screening protocols in this group [table 4a].

Table 4a. The relationship between the demographic characteristics of midwives, and their level of knowledge and practice in screening of preeclampsia during prenatal care.

Variables	Knowledge on risk factors		Knowledge on signs and symptoms		Knowledge on danger signs		Practices	
	ρ	p-value	ρ	p-value	ρ	p-value	ρ	p-value
1. Age	-.175	.135	-.160	.174	-.011	.924	-.005	.964
2. Educational attainment	.060	.611	-.216	.064	.201	.086	-.238*	.041
3. Type of facility	.115	.328	-.117	.319	-.106	.371	-.015	.900
4. Years of experience	-.003	.979	-.092	.437	.021	.857	-.078	.916

The relationship between the level of knowledge and practice in screening of preeclampsia demonstrates that knowledge is a key driver of performance: knowledge of risk factors ($\rho = 0.249$, $p < 0.05$) and knowledge of signs and symptoms ($\rho = 0.348$, $p < 0.01$) both showed significant positive correlations with actual screening practices. This implies that improving a midwife's theoretical understanding of preeclampsia is a viable pathway to improving their clinical behavior [table 4b].

Table 4b. The relationship between the level of knowledge and practice in screening of preeclampsia during prenatal care.

Variables	Knowledge on risk factors	Knowledge on signs and symptoms	Knowledge on danger signs	Practice
Knowledge on risk factors	1	0.352 **	-0.072	0.249*
Knowledge on signs and symptoms		1	0.287*	0.348 **
Knowledge on danger signs			1	0.137
Practices				1

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

DISCUSSION

Midwives that had over 10 years of experience suggest expert level of competence, having this range of experience enables them to strengthen their clinical judgement and ability to identify early warning signs of complications like preeclampsia, however our study findings showed no significant relationship between age, type of facility and years of experience [Bradfield et al., 2023; Sligo et al., 2024]. Moreover, educational attainment showed a significant correlation with practice. This contradicts the findings wherein according to them advancing to a four- year degree is a crucial determinant of clinical competence and quality service delivery of (Felipe-Dimog et al., 2023). The higher the educational attainment likely provides the theoretical and clinical foundations necessary for accurate screening (Sharma et al., 2018). Moreover, being assigned in the Barangay Health Stations/Rural Health Units, at the primary care level means these midwives are the frontline health workers. Their ability to screen is effectively dominant, however they are the most vulnerable to the diagnostic gap, as their facility type and availability of tools directly influence the accuracy of preeclampsia identification (Billah et al., 2021).

While the majority of respondents recognized high blood pressure as a significant risk factor in screening for preeclampsia which aligns with the clinical indicators of the American Heart Association (2025), there is a stark lack of awareness regarding the other important clinical indicators of preeclampsia. These gaps align with the finding wherein while midwives are central to care, they often overlook moderate risk indicators, which lead to undiagnosed cases of preeclampsia (Lehang et al., 2024). Similarly, all the respondents identified hypertension and edema as signs and symptoms of preeclampsia, however, other signs and symptoms are markedly low. The ability to detect preeclampsia early is one of the main challenges that midwives face, if these red flags or signs and symptoms were missed the action for early intervention may be missed. Moreover, the results also show that most of the respondents were classified as having low knowledge of danger signs of preeclampsia whereas midwives should have adequate knowledge about the warning sign as these symptoms are important to be recognized by the midwives, as failure to do so may result in missed or delayed. According to Sabrida et al (2023) variation in midwives' knowledge and practice in screening can make it harder to detect preeclampsia early and correctly, which can reduce the chance of preventing complications with timely medical management.

Accurate screening and diagnosis by midwives during prenatal care serve as foundation for early detection and management (American College of Obstetricians and Gynecologists, 2020; 2025). Alreshidi et al., (2026) underscored that these gaps in midwives' knowledge and practice can be addressed through strong policy support and accessible in-service training, continuous professional development, allowing midwives to acquire updated knowledge and essential practices for effective preeclampsia care and detection.

Midwives play an important role in screening of preeclampsia as they are considered as the first contact who directly care, conduct physical examination including basic screening such as vital signs monitoring, conduct health teaching to provide additional knowledge regarding pregnancy (Sabrida et al., 2023). Midwives often develop competence in identifying visible clinical indicators through hands-on practice, majority of respondents working in primary care settings such as Barangay Health Stations/Rural Health Units, where blood pressure measurement and weight measurement are routine (Garti et al., 2021). However, results show that midwives did not perform these essential screening procedures.

Precise blood pressure measurement is crucial for the early detection of hypertension (Mkansi et al., 2021). Yet only few midwives adhered to these protocols, which could result in misdiagnosis or delayed treatment. The same as measurement of weight and calculation of BMI are important for identifying obesity ($BMI \geq 30$ kg), a known risk factor for preeclampsia. Observation midwives rarely use the crucial screening methods such as the mean arterial pressure (MAP) and Body Mass Index (BMI), even if these methods are clearly stated in the Maternal and Child Health (MCHN) Book (Lehang et al., 2024). Higher the educational attainment and four-year degree programs are crucial for better preparation and competitive edge of a midwife. However, significant findings emerge regarding the midwife practice, specifically concerning educational attainment, indicating that higher degrees do not automatically lead to better adherence to screening protocols (Sharma et al., 2018; Felipe-Dimog et al., 2023). Improving the midwife's theoretical knowledge or understanding specifically the updated clinical symptoms is one of the necessary pathways to improve their clinical behavior and accuracy in the field (Alreshidi et al., 2026).

While this study provides valuable insights to midwives' knowledge and skills in screening of preeclampsia, several limitations must be considered. First the data collection relied on self-reported questionnaires and observational checklists which may introduce bias due to over estimation of skills or tendency for the respondents to provide socially desirable answers rather than true reflection of their practices. Second, the sample size was limited to 74 licensed midwives who were available during the data collection period, which is smaller than the original target population; this may not fully represent all the midwives in the province. Third, the study's scope was limited only to the municipalities of SAMARICA, which can affect the generalizability of the findings to midwives in other municipalities. Lastly, the research did not measure the actual patients' outcomes or long- term effectiveness of the screening practices in reducing the maternal complications, making it difficult to evaluate the direct impact of midwives' knowledge and skills on maternal health.

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CONCLUSIONS AND RECOMMENDATION

The study found that midwives in the SAMARICA area of Occidental Mindoro were predominantly female, mostly aged 25–34 years, had over 10 years of professional experience, and commonly held a Bachelor of Science in Midwifery degree. Despite their educational attainment and experience, participants demonstrated low overall knowledge of preeclampsia screening, particularly regarding risk factors, warning signs, and the broader clinical presentation of the condition. While knowledge of classic indicators such as hypertension and edema was relatively high, substantial gaps remained in comprehensive screening knowledge. Similarly, midwives exhibited low levels of adherence to recommended screening practices. Although physical examinations were routinely conducted, essential procedures such as accurate weight measurement and proper blood pressure assessment were inconsistently performed. Sociodemographic and professional factors, including age, facility type, and years of experience, were not significantly associated with knowledge or practice levels. Notably, higher educational attainment showed a negative correlation with screening practices. However, greater knowledge of risk factors and clinical manifestations was positively associated with improved screening practices, highlighting the importance of strengthening theoretical and clinical competencies in preeclampsia screening.

Healthcare administrators and local health authorities should strengthen continuing professional development programs focused on the comprehensive screening and early detection of preeclampsia. Training initiatives should emphasize risk assessment, recognition of warning signs, and adherence to evidence-based screening protocols, supplemented by practical skills training and competency assessments. Midwives and Barangay Health Workers should consistently follow standardized prenatal screening procedures, particularly in obtaining accurate weight and blood pressure measurements. Regular supervision and monitoring mechanisms should be implemented to ensure compliance with established clinical guidelines. The Department of Health, Provincial Health Office, and Municipal Health Offices should ensure the availability of essential screening equipment and promote the adoption of evidence-based practices aligned with international guidelines. Furthermore, support systems should be established to facilitate ongoing competency development among frontline maternal health providers. Future studies should include a broader geographic scope to improve generalizability and explore factors influencing the gap between knowledge and clinical practice. Further research is also recommended to evaluate the impact of improved preeclampsia screening practices on maternal and neonatal outcomes.

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DECLARATION OF CONFLICT OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF AI USE

The authors used Grammarly for grammar checking and language editing. All outputs were reviewed and validated by the authors, who take full responsibility for the content.

AUTHOR CREDIT STATEMENT

Concepcion, A.M: Conceptualization, Supervision, Methodology, Investigation, Formal Analysis, and Writing – Original Draft; **Dansecro, A.K:** Conceptualization, Methodology, Investigations, Writing – Original Draft; **Cirineo, R. S:** Conceptualization, Methodology, Investigations, Writing – Original Draft; **Cabaruan, A:** Conceptualization, Methodology, Investigations, Writing – Original Draft; **Bandiola, M:** Methodology, Investigations, Writing – Review & Editing; **Felipe, J:** Investigations, Writing – Review & Editing; **Ramos, M.J:** Investigations, Writing – Review & Editing; **Colonia, R.G.:** Supervision.