

# Healthcare Workers' Self-Reported Competence in the Management of Pre-Eclampsia and Eclampsia at Primary Health Care Facilities in Ekiti State, Nigeria

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## ABSTRACT

**Background:** Eclampsia remains an enigmatic obstetrics catastrophe that ranks second to obstetric hemorrhage as the leading cause of maternal mortality in sub-Saharan Africa. Early detection of pre-eclampsia and emergency management of severe pre-eclampsia and eclampsia are important in reducing morbidity and mortality from this life-threatening disease spectrum. This study aimed to assess the factors associated with competencies in the detection and emergency management of Pre-eclampsia and Eclampsia by Primary Healthcare workers in Ekiti State, South West Nigeria.

**Methods:** This study was a cross-sectional self-administered questionnaire-based survey. Healthcare personnel working at four primary healthcare facilities completed self-administered questionnaires at a training session on Basic and Emergency Obstetric and Neonatal care (BemONC).

**Results:** The questionnaires were completed by 302 healthcare workers, the majority of whom were Community Extension Health Workers in Ekiti State. Among the participants, 68.2%, 2%, and 1% reported accurate detection, accurate emergency management, and accurate detection with the emergency management of Pre-eclampsia and Eclampsia respectively. The odds of self-reported accurate detection of Pre-eclampsia and Eclampsia is increased by 7 in those with more than 25 years of experience. Community Extension Care Workers were about 78% less likely to be able to detect Pre-eclampsia and Eclampsia compared with doctors.

**Conclusion:** Although the majority of the healthcare personnel at the primary healthcare level could detect Pre-eclampsia and Eclampsia, only a few reported the ability to institute accurate emergency management and referral protocol. Training and retraining of primary health care workers on essential and emergency obstetrics care are advocated.

**Keywords:** Healthcare workers; Primary Health care; Competence; Pre-eclampsia; Eclampsia.

## INTRODUCTION

Hypertensive disorders of pregnancy (HDP) with the most severe forms; Pre-eclampsia (PE) and Eclampsia occur in 5 to 10% of all pregnancies.<sup>1,2</sup> The prevalence of Hypertensive disorders of pregnancy has been soaring lately due to the increasing prevalence of cardiovascular diseases and obesity in younger women of reproductive

age groups even in developing countries like Nigeria.<sup>2,3</sup> Hypertensive disorders of pregnancy, specifically, Pre-eclampsia and Eclampsia are associated with significant adverse maternal and neonatal outcomes.<sup>3</sup> Pre-eclampsia and Eclampsia constitute the second cause of maternal deaths globally.<sup>4</sup> Worthy of emphasis is their contribution to maternal mortality in Nigeria. Nigeria is

responsible for 23% of maternal deaths worldwide.<sup>5</sup> Recent findings on maternal mortality in Nigeria by Oladapo et al, cited preeclampsia/eclampsia as the leading cause of maternal mortality responsible for 29% of maternal deaths.<sup>6</sup> With this huge contribution of hypertensive disorders to maternal deaths in Nigeria, it is necessary to deliver quality healthcare to parturients to stem the tide of maternal mortality in the country.

Primary health care (PHC) is a grass-root management approach to the provision of basic essential healthcare services to individuals, families, and communities.<sup>7,8</sup> In Nigeria, Primary healthcare is delivered by both Basic and Comprehensive Healthcare facilities.<sup>6</sup> These facilities are spread across Local Government Areas (LGAs) to improve equity and access to healthcare services.<sup>8</sup> The categories of healthcare workers in these facilities include Doctors, Midwives, Nurses, Community Health Extension Workers (CHEW), Health Information Officers, and Pharmacy Technicians. Greater than seventy percent of the Nigerian population reside in rural and semi-urban areas where access is mostly to the Primary healthcare centers<sup>7</sup>. Primary healthcare facilities account for 80% of healthcare facilities in Nigeria.<sup>7,9</sup> Therefore, this critical mass of healthcare workers in the Primary healthcare facilities constitutes the entry point of the majority of parturients to healthcare in the country. Considering the locations and structures of these facilities, it is obvious that their operations will have a significant impact on the population health indices as documented in a previous evaluation of this policy in Nigeria.<sup>10</sup> In Nigeria, the role of the healthcare workers at the Primary healthcare facilities is to provide maternal care for uncomplicated pregnancies and deliveries, detect complications when they occur, and refer them appropriately.

Previous researchers have documented an increased risk of maternal deaths in Nigeria when a woman is referred after developing complications.<sup>6,11</sup> Also, a higher prevalence

of severe maternal outcome (SMO) being referred to tertiary hospitals had been documented in Nigeria compared to other countries<sup>6</sup>; which is attributable to the late presentation of parturient following the occurrence of complications. The majority of these patients with SMOs are usually referred from Primary healthcare facilities after developing complications. This underscores the importance of allowing staff who do not have competencies for specific tasks to deliver them thereby increasing the level of healthcare access.<sup>2,13</sup> The World Health Organization (WHO) has outlined two approaches of 'task shifting' and 'task sharing' to expand the frontier of healthcare delivery, particularly in low-resource settings like Nigeria which has been further devastated by brain drain. Task sharing enables low and mid-level healthcare workers such as Community Health Extension Workers (CHEWs), Nurses, Midwives, and other frontline health personnel to seamlessly complement the efforts of the higher-level health professionals by assisting in tasks normally restricted to the domain of these overburdened and not freely accessible higher-level professionals thereby promoting efficiency within our health system.<sup>12-14</sup>

It is then necessary to beam searchlight on the practice of primary healthcare workers to reduce the burden of late presentation at tertiary hospitals. Our team assessed the self-reported competencies of PHC workers in the early detection and emergency life-saving management of Pre-eclampsia and Eclampsia.

## **MATERIALS & METHODS**

This cross-sectional self-administered questionnaire-based survey was conducted among primary health care workers in four out of sixteen Local Government Areas (LGAs) of Ekiti State, Southwest Nigeria. Ekiti State with a population of 2,384,212 people is one of the six states in southwest Nigeria delineated into 16 sub-administrative units referred to as Local

Government Areas (LGAs). Primary Healthcare Workers (PHWs) actively practicing in four out of the sixteen LGAs in Ekiti State participated in this survey carried out during one-week training on Basic and Emergency Obstetric and Neonatal Care (BEmONC) organized by the Ekiti State Ministry of Health and Human Resources in conjunction with World Health Organization in June 2021.

The sample size was calculated with Leslie Fisher's formula using the prevalence of 50% for accurate diagnosis of Pre-eclampsia and Eclampsia, 95% confidence interval with a degree of error allowance of 0.05, and 10% attrition rate.<sup>11</sup> A total of 368 PHC workers were counseled and recruited for the survey but 302 completed the questionnaires. The inclusion criterion was being a healthcare worker in any of the 4 selected LGAs while the exclusion criterion was a refusal to participate. The healthcare workers included medical doctors, midwives, nurses, and community health extension workers (CHEW). They are trained to provide primary health care for common health conditions especially maternal and child health. They were educated up to MB; BS, diploma, and advanced diploma levels. This cohort of health workers is usually deployed to primary healthcare facilities in Ekiti State, Nigeria.

Participants were counseled about the study and verbal consent were obtained before the questionnaires were handed over to them. The participants were informed that they could withdraw from the study at any stage without any consequence. Those who declined consent were not victimized in any way. The process of data collection was carried out without undue risks to the participants. There was no financial cost to the subjects at any stage of the study. The study was performed in compliance with the principles of the Declaration of Helsinki, Good Clinical Practice, and the World Association for Social, Opinion, and Market Research (ESOMAR) guidelines. The

Research and Ethics and Research Committee of Ekiti State Ministry of Health and Human Resources approved the study protocols

Our study questionnaires had 3 sections. Section A included questions on the participants' characteristics like biodata, local government area, cadre, profession, and years of practice. Sections B and C included questions on the diagnosis and management of pre-eclampsia and eclampsia respectively. The participants' abilities to detect and manage pre-eclampsia and eclampsia were assessed with responses to questions in Sections B and C. Questions about hypertension in pregnancy and significant proteinuria were included in Section B while questions about the use of antihypertensives, anticonvulsants, and management of unconscious patients were included in Section C. Participants who ticked correct answers in section B were classified as able to detect pre-eclampsia and eclampsia accurately while those who ticked correct answers in Section C were classified as able to manage pre-eclampsia and eclampsia accurately. The questionnaire was piloted using healthcare workers working in other PHC facilities not invited for the training to validate the instrument and ensure the questions were unambiguous before the study.

## **STATISTICAL ANALYSIS**

The data were analyzed with SPSS version 23 (Chicago, IL). The data were summarized in frequencies and percentages. Odds-adjusted Odds ratios were used to obtain associated factors with the accurate detection of pre-eclampsia and eclampsia. A p-value less than 0.05 was taken as statistically significant.

## **RESULT**

Out of the 368 participants recruited for the study, 302 completed the questionnaire resulting in a response rate of 82.1%. The Biosocial characteristics of the participants are presented in Table 1.

**Table 1: The Biosocial characteristics of the participants.**

CHARACTERISTICS	NUMBER	PERCENTAGE (%)
Age<20 years	3	1
20-29 years	15	5
30-39 years	74	24.5
40-49 years	176	58.3
50-59 years	34	11.3
Sex Male	13	4.3
Female	288	95.4
Profession		
Doctor	11	3.6
Midwife	16	5.3
Nurse	18	6.0
Chew	247	81.8
Others	10	3.3
HighestLevel of Education		
CHEW	89	29.5
SCHEW	32	10.6
CHO	22	7.3
RN/RM	40	13.2
BSc/BNSc/MBBS	119	39.4
Duration of practice		
0-5 years	14	4.6
6-10 years	24	7.9
11-15 years	119	39.4
16-20 years	78	25.8
21-25 years	24	7.9
26-30 years	32	10.6
31-35 years	11	3.6
Location of Practice		
Ado	139	46
Ikere	125	41.4
Ikole	2	0.7
Oye	36	11.9
Type of Primary Health care		
Basic	231	76.5
Comprehensive	71	23.5

Participants were mostly women, aged 30-49 years, the majority of whom were community health extension workers (81.8%). Doctors and nurses accounted for 3.6% and 11.3% of respondents respectively.

Figure 1 shows the self-reported competencies of primary health care workers to detect, manage and detect and manage respectively in Ekiti State, Southwest, Nigeria.

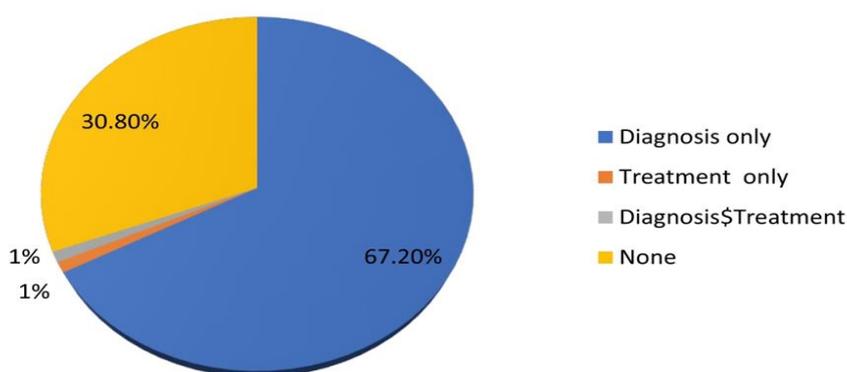


Figure 1 shows that out of the 302 that participated in this survey, 68.2% (206), 0.66% (2), and 0.33% (1) reported accurate detection, accurate management, and accurate detection with the management of Pre-eclampsia and Eclampsia respectively.

**Table 2: Regression of factors determining accurate detection of Pre-Eclampsia and Eclampsia among Primary Healthcare Workers in Ekiti State, South West Nigeria.**

FACTORS	ODDS RATIO (95% CI)	ADJUSTED ODDS RATIO	P VALUE
Age<20 years	0.71(0.59-8.88)	0.35(0.02-8.12)	0.79
20-29 years	1.63(0.48-5.55)	2.64(0.54-12.84)	0.43
30-39 years	0.49(0.21-1.17)	1.81(0.57-5.71)	0.11
40-49 years	0.62(0.29-1.32)	2.15(0.78-5.90)	0.21
50-59 years	Ref	Ref	-
Sex female			
Male	Ref	Ref	-
Female	1.88(0.72-5.56)	0.45(0.10-1.97)	0.28
Profession			
Doctors	Ref	Ref	-
Midwives	0.95(0.19-4.67)	0.80(0.09-7.48)	0.84
Nurses	0.90(0.19-4.24)	0.89(0.11-7.65)	0.92
CHEWs	0.20(0.06-0.72)	0.12(0.02-0.90)	0.03
Others	0.25(0.04-1.52)	0.16(0.01-1.78)	0.13
Duration of practice			
0-5 years	Ref	Ref	-
6-10 years	0.27(0.06-1.20)	0.96(0.12-7.84)	0.98
11-15 years	0.47(0.15-1.46)	2.48(0.43-4.52)	0.31
16-20 years	0.63(0.20-2.0)	3.23(0.54-9.46)	0.20
21-25 years	0.67(0.17-2.59)	2.97(0.42-21.27)	0.28
26-30 years	1.33(1.17-4.73)	7.39(1.53-9.80)	0.04
31-35 years	1.60(1.3-7.85)	9.63(1.03-12.57)	0.04
Location of Practice			
Ado	Ref	Ref	-
Ikere	0.53(0.31-0.90)	0.42(0.23-0.79)	0.007
Ikole	0.29(0.02-9.14)	0.24(0.19-19.29)	0.94
Oye	1.07(0.50-2.26)	0.97(0.40-2.34)	0.94
Type of Primary Health care			
Basic	Ref	Ref	-
Comprehensive	0.80(0.45-1.43)	0.58(0.29-1.16)	0.12
Level of Education			
CHEW	Ref	Ref	-
SCHEW	0.99(0.42-2.37)	0.88(0.39-2.31)	0.80
CHO	0.64(0.22-1.91)	0.62(0.19-2.06)	0.43
RN/RM	0.93(0.42-2.10)	0.46(0.18-1.19)	0.11
BSc/BNSc/MBBS	1.15(0.64-2.06)	0.72(0.36-1.42)	0.35

Table 2 shows the regression of factors determining accurate detection of Pre-eclampsia and Eclampsia among primary healthcare workers in Ekiti State, South West Nigeria. The odd of primary health workers who have practiced for 26-30 years to be able to detect Pre-eclampsia and Eclampsia accurately was 7.39 (95% CI 1.53-9.80) while it was 9.63 (95% CI 1.03-12.57) for those who have practiced for 31 to 35 years. In addition, community healthcare extension workers were less likely to be able to detect hypertensive disorders compared to a doctor. (OR 0.12, 95%CI 0.02-0.90). The duration of practice and status of the PHC workers were significantly associated with the accurate detection of hypertensive disorders of pregnancy. Participants who were practicing in Ikere-Ekiti local government area were less likely to detect Pre-eclampsia/Eclampsia accurately (OR 0.42, 95% CI 0.23-0.79).

Other factors like age, sex, level of education, and the cadre of workers were not statistically significant.

## DISCUSSION

High-quality health care is necessary for enhanced patient benefits, patient safety, and a positive patient experience.<sup>15</sup> Primary healthcare is the bedrock of universal health coverage.<sup>8</sup> The provision of Quality health care with the utilization of appropriate skills and technology by healthcare workers at Primary healthcare facilities is critical to achieving health for all. Quality of care depends on structure (adequacy of physical environment and systems), process (components of care delivered), and outcomes (satisfaction status of clients).<sup>6-18</sup> Accessing the competence of PHC healthcare workers in the management of Pre-eclampsia and Eclampsia is a way of accessing the process component of quality of care.

We found that almost all Primary health workers could not provide adequate emergency care for parturients with Pre-eclampsia and Eclampsia, however, two-thirds could detect them accurately. This is a huge gap in the quality of care at these Primary healthcare facilities. These workers are supposed to be able to detect and institute emergency life-saving care like the use of antihypertensive and Magnesium Sulphate before referring the parturient to referral centers. This might explain the late presentation of parturient at the referral centers leading to a high proportion of SMOs.<sup>6</sup> A Community health extension worker (CHEW) was almost 80% less likely to detect Pre-eclampsia/Eclampsia compared to a doctor; comparable to findings from Salomon et al.<sup>16</sup> However, these cadres of healthcare workers constitute only 3.6% of healthcare workers in the Primary healthcare facilities included in this study. Some researchers have documented poor quality of care in Nigeria's Primary healthcare centers.<sup>15,16</sup> Salomon et al specifically investigated the quality of antenatal care being offered at Nigeria's Primary healthcare centers and established poor quality of care relating to workers' knowledge and technical skill in the management of pre-eclampsia.<sup>16</sup>

In addition, those with more than 25 years of practice were more likely to diagnose Pre-eclampsia/Eclampsia accurately. Just 14.2% of this category is unevenly distributed within the four LGAs in this study. This may be because older staff can influence their inclusion as participants in a few pieces of training organized for Primary healthcare workers. This cadre is, therefore, able to detect and manage Pre-eclampsia and Eclampsia more than their younger counterparts who have little or no access to in-service training. Primary healthcare workers in Ikere-Ekiti LGA were also less likely to diagnose Pre-eclampsia and Eclampsia compared to those in Ado-Ekiti LGA. This could be due to the concentration of competent Primary healthcare workers in Ado-Ekiti LGA which is an urban region

compared to Ikere-Ekiti LGA, which is a semi-urban region. Similarly, there may also be a concentration of training programs in Ado-Ekiti LGA located in the State capital.

## **CONCLUSION**

Given the uniqueness of Nigeria, with a very poor doctor-to-patient ratio, there is a need for training and continued educational support of all cadres of health workers for them to undertake the tasks they are to perform. Routine supportive supervision and a well-functioning referral system are pivotal to acceptable healthcare delivery. We propose that the training curriculum of the Community health extension workers (CHEWs) in the Colleges of Technology be reviewed and tailored towards the services to be rendered at the Primary health care centers. This should include a review of the curriculum adequately addressing relevant modules on Basic and Emergency Obstetric and Neonatal Care (BEmONC) including hands-on training on the use of safe emergency antihypertensives and Magnesium Sulphate and safe referral protocols. Training and re-training of junior non-physician healthcare workers in primary healthcare facilities should be prioritized because they make up the critical mass of healthcare workers at this level. Other cadres should also be re-trained periodically. In addition, the distribution of healthcare workers in Primary healthcare facilities in Nigeria should reflect equity which is one of the aims of Primary healthcare.<sup>16</sup>

A limitation of this work is the fact it is self-reported; their skills were not observed while offering services. Also, only a process indicator of the quality of care was assessed. These limitations notwithstanding, the findings from this study can be used as an indicator of the quality of care being offered at these PHC facilities, and policies can be directed toward rectifying the drawbacks identified.

**Declaration by Authors**

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