International Journal of Recent Advances in Multidisciplinary Topics
Volume 6, Issue 6, June 2025
https://www.ijramt.com | ISSN (Online): 2582-7839

Adherence to Ministry of Health Guidelines in Management of Severe Preeclampsia at Kenyatta National Hospital

Esther Njeri Nduati[1*], Dominic M. Mogere[2], George Njoroge[3]
[1,2,3]*Mount Kenya University, Thika, Kenya*

***Abstract*: This paper presents a study on adherence to ministry of health guidelines in management of severe preeclampsia at Kenyatta National Hospital.**

***Keywords*: Preeclampsia, Maternal mortality.**

1. Introduction

A. Background of the Study

Globally the prevalence rate of preeclampsia stands at 4.6% while the prevalence rate of eclampsia stands at 0.3% (Machano & Joho, 2020). Preeclampsia, characterized by hypertension and proteinuria, may affect a previously normotensive woman after 20 weeks of pregnancy. Severe preeclampsia is diagnosed when a patient displays certain specific symptoms. These symptoms include consistently high blood pressure readings (160/110 mmHg), hepatic or renal failure, a platelet count below 100,000/mm3, the presence of syndrome, cerebral or visual disturbances, persistent severe epigastric pain, and pulmonary edema.

The World Health Organization (WHO) reports that the prevalence of preeclampsia is 2.8 times greater in underdeveloped countries than in industrialized ones. This is especially true in Sub-Saharan Africa. Both in industrialized (0.5-1.8% risk) and poor nations (+15% risk) countries, eclampsia is linked to higher risk of maternal mortality. Similarly, Masai (2020) reported that the preeclampsia prevalence in Ethiopia is about 5%, whereas in Nigeria it varies from 2% to 16.7%. Preeclampsia and eclampsia are among the top five primary causes of maternal and infant death in Sub-Saharan African nations. The study was conducted by Meazaw *et al*. (2020). In 2015, Sub-Saharan Africa accounted for approximately 66% of global maternal deaths, as revealed by the findings. The World Health Organization (WHO) has identified hypertensive disorders of pregnancy (HDP) as the prominent cause of maternal mortality in several African contexts. This highlights the significant impact of HDP on maternal health outcomes in the region and emphasizes the urgent need for targeted interventions and improved healthcare services to address this critical issue. By prioritizing the prevention, detection, and effective management of HDP, healthcare systems can make substantial strides in reducing maternal fatalities and promoting better maternal health in African countries. One-sixteenth of all maternal deaths in Sub-Saharan Africa may be attributed to HDP, which are multisystem illness (Gemechu *et al*., 2020).

There has been a problem with maternal mortality in Kenya for at least the last two decades.

UNFPA Kenya (2023) reports a rate of 355 deaths per 100,000 live births, translating to about 5,000 women dying annually from pregnancy and childbirth complications. World Bank (2023) indicates a modeled estimate of 414 deaths per 100,000 live births. Pregnant women might die from both immediate and secondary complications during labor and delivery. Several direct causes include maternal hemorrhage, sepsis, preeclampsia, eclampsia, obstructed labor, and abortion. According to Oikonomou *et al*. (2020) there is a high maternal death and morbidity rate due to severe preeclampsia. Furthermore, preeclampsia and eclampsia may lead to renal and hepatic failure, microvascular damage, brain and hematologic derangements, and even death if not well handled (Oikonomou *et al*., 2020).

B. Statement of the Problem

Every three minutes, a pregnant woman dies globally due to preeclampsia and eclampsia. According to estimates, 14% of all maternal deaths can be attributed to this syndrome (OMS, 2020). The hypertensive diseases of pregnancy known as eclampsia and severe pre-eclampsia are among the topmost five causes of direct maternal mortality (Muchiri *et al*., 2021).

Confidence *et al*. (2022) conducted a study in Uganda, which noted that many healthcare providers were not following the MoH (Ministry of Health) standards for the managementoof severeepre-eclampsiaaandeeclampsia. The study found that some healthcare providers did not regularly measure blood pressure, there was inconsistent use of urine dipsticks, incomplete documentation was observed, and many lacked confidence in using magnesium sulfate to manage severe pre-eclampsia and eclampsia. The reasons behind these practices were not known.

Kenya Demographic Health Survey done in 2014 found that the maternal mortality rate in Kenya was 362. This was a

*Corresponding author: nduatiest@gmail.com

decrease from the 2008 rate of 520.1 per 100,000 live births, but it was still above the national health policy goal of 150. In Kenyatta National Hospital, 251 cases of eclampsia and 1036 cases of severe preeclampsia have been reported in the year 2021, among these cases, 54 (21.5%) deaths related to eclampsia and 62 (6%) deaths related to severe preeclampsia have been reported as per the maternity ward/maternity Intensive Care Unit (ICU) admission registers 2021 as shown on the table 1. Although Kenya has national standards for the treatment of preeclampsia and eclampsia, their adherence had not been evaluated (Muchiri *et al*, 2021).

C. Justification of the Study

Severe preeclampsia is a serious and potentially life-threatening pregnancy complication for both the mother and the unborn child (Chang, Seow, & Chen, 2023). In Kenya, the burden of preeclampsia and eclampsia is significant but remains underexplored in the literature. Maternal morbidity from preeclampsia and eclampsia has been found to be substantial, with an unpublished hospital study at a national referral facility in Kenya reporting that 4.5% of patients required admission to the critical care unit due to complications arising from these conditions.

Adherence to established national guidelines for managing severe preeclampsia is crucial for ensuring optimal patient outcomes. However, factors influencing non-adherence among healthcare providers remain insufficiently studied. Understanding the determinants of non-adherence can help identify areas for improvement in healthcare delivery, ultimately leading to better maternal and neonatal care.

Furthermore, this study aims to bridge existing knowledge gaps regarding adherence to severe preeclampsia management guidelines in Kenya. While national guidelines exist, little empirical data has been published on the extent of their implementation at Kenyatta National Hospital (KNH). This study will provide valuable insights into the factors influencing non-adherence and contribute to the existing body of knowledge in maternal healthcare.

2. Literature Review

Educational preparation contributes to a significant role in determining the level of awareness that midwives have on the treatment of preeclampsia. When compared to enrolled midwives, it was discovered that registered midwives had a greater likelihood of being familiar with the Ministry of Health criteria for the care of PE (Angelina *et al*., 2020). The same study revealed that poorer adherence to the Ministry of Health requirements was connected with differences in the knowledge and abilities held by midwives who had received different types of training. It was suggested that the policymakers and trainers of the midwives consider the efficacy of the certificate nurse training as compared with that of the registered midwives (Angelina *et al*., 2020).

A study by Angelina *et al*., (2020) revealed that the majority of the midwives had worked in the maternity unit for less than five years meaning that good working experience is not retained in the unit. It was shown that most of the nurses in Nigeria knew that $MgSo_4$ was the drug of choice in combating and treating PE/E. A number of studies have demonstrated that midwives lack knowledge on monitoring of fetal heart rate when diastolic blood pressure is >110 mmHg in a pregnant woman. A study by Confidence *et al*. (2022) showed that 86.1% of midwives were monitoring the fetal heart rate. But a study by Garovic *et al*. (2022) found that only 2.7% were monitoring fetal heart rate when the diastolic blood pressure is >110 mmHg. The study mentioned that this could be probably either nurse lacked knowledge about the recommendations by the guidelines on monitoring of fetal heart rate when diastolic blood pressure is >110 mmHg.

Most of nurses lack this knowledge. This is evidenced in two studies done by Confidence *et al*. (2022) where 70.8% of nurses were not following the criteria of urine deep stick as recommended and Garovic *et al*. (2022) found that 81.8% of nurses were not following the recommendations. Yet, in the same research, nurses' awareness of when to order a complete blood count, and kidney, and liver function tests was up to 98% in accordance with the guidelines' recommendations. These 81.8% were better than those found by Muchiri and colleagues at Pumwani Hospital (Muchiri *et al*., 2021).

Garovic *et al*. (2022) noted that certain healthcare professionals are lacking in their knowledge of PE/E management, namely the appropriate dosage and administration of MgSO4. Respondents also expressed a lack of faith in MgSO4 or a perceived fear of its toxicity, which limits its use, particularly among physicians working in dispensaries and health facilities. The findings of their investigation coincided with those of another study done in Kenya that found gaps in the availability of parenteral anticonvulsant medication (Ndwiga & Warren, 2018). In addition, it was discovered that midwives are familiar about an advised medicine that controls convulsions with a high percentage after receiving training on the subject, which indicates that they stick to the Ministry of Health's requirements (El Rheem & Mousa, 2018). This finding was consistent with the findings of other studies, which demonstrated that this was the case. This was because new people were brought on board who were aware of the recent adjustments that were made in the treatment of preeclampsia, which resulted in reduced adherence to protocol (Olaoye *et al*., 2019). The hurdles that prevent people from using MgSO4, as viewed by the experts, reveal that a lack of understanding in the calculation of its dosage inhibits people's ability to adhere to the MoH standards (Arnet *et al*., 2018).

Olaoye *et al*. (2019) discovered that a significant proportion of the participants demonstrated a good understanding of the guidelines. This was controversial to other studies which showed that only some participants were knowledgeable of the WHO management practices on PE/E. The difference was associated with unavailability of information and education among the midwives. It was noted that WHO recommends the use of Methyldopa, Nifedipine, and Hydralazine nevertheless, few of the midwives were aware of the correct standard drugs. With the lack of knowledge on the WHO guidelines in dealing with PE/E, there would be less adherence on their management.

3. Research Methodology

The study adopted a descriptive cross-sectional study design since data was collected from a sample at one specific point in time and over a relatively short period. Cross-sectional studies have the capability to simultaneously gather both quantitative and qualitative data, facilitating their integration within the study. By using qualitative methods, potential limitations related to the exclusive reliance on quantitative methods can be mitigated. The design exhibits efficacy in establishing a connection between quantitative and qualitative data outcomes. The research was conducted at Kenyatta National Hospital. Kenyatta National Hospital is located in Kenya's Nairobi West District of Nairobi County

The study population was all midwives working in the maternity unit at the time of the study.

To secure entry to the hospital, the researcher followed a series of steps. Firstly, the researcher acquired a letter from Mount Kenya University and gain approval from the university's Ethical Review Committee and the UON-KNH Ethics and Research Committee.

A systematic sampling method was used to select the 147 nurses from the population of 236 nurses at intervals of selecting a sample from a larger population at regular intervals. The study used structured questionnaires for the midwives and interview guide for the nursing officers in charge. Conducting a pretest study of the research tools was essential in order to strategically organize and validate the instruments for a large-scale investigation, as well as to determine the likelihood of obtaining the anticipated results.

The data collected was quantitative and qualitative. The qualitative data was edited, coded, entered, and cleaned. The findings of this data processing were designed to provide the researcher with information that allowed them to draw conclusions and make judgments.

4. Results and findings

A. Nurses Knowledge on Ministry of Health Guidelines in Severe Preeclampsia Management

Table 1 shows the frequency and percentage of respondents who have been trained on MOH guidelines on management of preeclampsia, have the knowledge on the management of severe preeclampsia as provided for by Ministry of Health, and their level of knowledge on the management of severe preeclampsia as provided for by Ministry of Health.

The findings showed that 62.5% of the respondents had been trained on MOH guidelines on management of preeclampsia. More so, 85.9% of respondents indicated to have the knowledge on the management of severe preeclampsia as provided for by the Ministry of Health. In a further assessed on the knowledge, 47.7% of respondents indicated to have a moderate level of knowledge on the management of severe preeclampsia as provided for by the Ministry of Health and an equivalent 47.7% of respondents indicated to have a high level of knowledge on the management of severe preeclampsia as provided for by Ministry of Health.

The respondents were further required to rate their levels of agreement with statements assessing their knowledge on the management of severe preeclampsia.

The statement that Magnesium sulphate is the anticonvulsants used in eclamptic fits had a mean of 4.32, Std. dev of 1.35. This showed a high agreement (74.2% strongly agree), indicating strong knowledge that magnesium sulphate is used as an anticonvulsant in eclamptic fits. However, a significant level of disagreement or variance in opinions was observed.

The mean of 3.97 indicated a general agreement that Magnesium sulphate dosage recommended by the WHO guidelines is 4 grams administered intravenously and 10 grams administered intramuscularly. The relatively higher standard deviation (1.48) suggests more variability in the responses, indicating that some respondents are either not sure about the specific dosage or disagree with the statement.

The mean of 3.67 shows that there was a general agreement

Table 1
Training on MOH guidelines on management of preeclampsia and the level of knowledge

		Frequency	Percentage
Trained on MOH guidelines on management of preeclampsia	Yes	80	62.5
	No	48	37.5
Have the knowledge on the management of severe preeclampsia as provided for by Ministry of Health	Yes	110	85.9
	No	18	14.1
Knowledge on the management of severe preeclampsia as provided for by Ministry of Health	Low	6	4.7
	Moderate	61	47.7
	High	61	47.7
	Total	**128**	**100**

Table 2
Statements assessing their knowledge on the management of severe preeclampsia

	SD	D	N	A	SA	Mean	Std. Dev
Magnesium sulphate is the anticonvulsants used in eclamptic fits	11.7	2.3	2.3	9.4	74.2	4.32	1.35
Magnesium sulphate dosage recommended by the WHO guidelines is 4 grams administered intravenously and 10 grams administered intramuscularly	11.7	11.7	4.7	11.7	60.2	3.97	1.48
Proteinuria is always a sign of preeclampsia	14.8	12.5	11.7	12.5	48.4	3.67	1.53
Magnesium sulphate is more effective in the prevention and treatment of severe eclampsia	9.4	14.8	4.7	22.7	48.4	3.86	1.40
Diazepam is the recommended anticonvulsant to use in eclamptic fits	19.5	17.2	21.1	11.7	30.5	3.16	1.51
Delivery of fetus is key in management of Pre-eclampsia	7	7	2.3	17.2	66.4	4.29	1.24
The onset of Preeclampsia has a warning	14.1	4.7	4.7	14.8	61.7	4.05	1.46

Source: Field Data (2023)

with the statement that Proteinuria is always a sign of preeclampsia. However, the high standard deviation of 1.53 reflected a divided opinion or uncertainty about the role of proteinuria in diagnosing preeclampsia.

The respondents agreed that Magnesium sulphate is more effective in the prevention and treatment of severe eclampsia (Mean=3.86), indicating that many respondents recognize the effectiveness of magnesium sulphate in managing severe eclampsia. However, the high Std. dev of 1.40 shows a variance in the respondents' opinions.

The respondents were neutral on the statements that Diazepam is the recommended anticonvulsant to use in eclamptic fits (Mean= 3.16, Std. dev: 1.51). Lower agreement and a higher level of disagreement (36.7% Disagree or Strongly Disagree), suggesting that many respondents correctly understand that diazepam is not the recommended first-line anticonvulsant in eclampsia (magnesium sulphate is).

With a mean of 4.29, the respondents strongly agreed that delivery of fetus is key in management of Pre-eclampsia. The high level of agreement indicated strong knowledge among respondents that delivering the fetus is a critical part of managing pre-eclampsia. The respondents also agreed that the onset of Preeclampsia has a warning as shown by a mean of 4.05, suggesting that many respondents believe there are warning signs for the onset of preeclampsia. The high Std. dev of 1.46 illustrates that the respondents had a high variation in the opinions.

B. Qualitative Findings

The interviewees described the nurses' level of knowledge on the Ministry of Health guidelines in severe preeclampsia management as moderate to good knowledge.

For instance, Key interviewee 3 stated;

''The level of knowledge among nurses about these guidelines tends to vary significantly. While some nurses demonstrate a thorough understanding and are adept at applying these guidelines in clinical practice, others may have a more basic awareness, necessitating further education and training'' (KI3).

They further stated that increasing the nurses' knowledge about the guidelines will lead to better adherence. It implies that the current level of knowledge might be insufficient for optimal application of the guidelines, and further education or training could enhance compliance.

Table 3
Chi-Square tests between being trained and adherence with MoH national guidelines

	Value	df	*p*-value
Pearson Chi-Square	4.136[a]	1	.042
Likelihood Ratio	4.007	1	.045
Linear-by-Linear Association	4.103	1	.043
N of Valid Cases	128		

Source: Field Data (2023)

The Pearson Chi-Square value is 4.136 with 1 degree of freedom and a *p*-value (Asymptotic Significance) of .042. The test's *p*-value is .042, which is slightly less than the conventional alpha level of 0.05 suggesting a statistical significance between training and adherence to the national guidelines in the management of severe preeclampsia.

Table 4
Chi-Square tests between knowledge on management and adherence with MoH national guidelines

	Value	df	*p*-value
Pearson Chi-Square	17.235[a]	1	.000
Continuity Correction	14.503	1	.000
Likelihood Ratio	13.497	1	.000
Fisher's Exact Test			
Linear-by-Linear Association	17.101	1	.000
N of Valid Cases	128		

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 2.95., Source: Field Data (2023)

Pearson Chi-Square value is 17.235 with 1 degree of freedom and a *p*-value (Asymptotic Significance) of .000. This test's *p*-value of .000, which is far less than the conventional alpha level of 0.05, indicates a statistically significant association between knowledge of management of severe preeclampsia and adherence to the national guidelines in the management of severe preeclampsia.

The study rejects the Null hypothesis, H01: The level of knowledge has no significant influence on adherence to the Ministry of Health guidelines in the management of severe preeclampsia among nurses at KNH. Therefore, the level of knowledge has a significant influence on adherence to the Ministry of Health guidelines in the management of severe preeclampsia among nurses at KNH.

5. Summary, Conclusion and Recommendations

A. Summary

A significant portion (62.5%) of the respondents had been trained on MOH guidelines for managing preeclampsia. Additionally, a high percentage (85.9%) indicated having knowledge of the management of severe preeclampsia as per MOH guidelines. The assessment of their knowledge levels revealed that nearly half (47.7%) of the respondents had a moderate level of knowledge, while an equivalent percentage reported a high level of knowledge on the subject.

When evaluating specific statements related to preeclampsia management; there was strong agreement and knowledge that magnesium sulcate is used as an anticonvulsant in eclamptic fits, though there was some level of disagreement or variance in opinions. A general agreement was noted on the recommended dosage of magnesium sulphate, as per WHO guidelines, but with considerable variability in responses. The role of proteinuria as a sign of preeclampsia showed general agreement, but with high variability, indicating divided opinions or uncertainty. Respondents recognized the effectiveness of magnesium sulphate in preventing and treating severe eclampsia, but opinions varied. There was a lower level of agreement and higher disagreement regarding the use of Diazepam as an anticonvulsant in eclamptic fits, indicating correct understanding among many respondents. There was strong agreement that the delivery of the fetus is key in managing pre-eclampsia. Many believed there are warning signs for the onset of preeclampsia, yet opinions varied

significantly. The interviewees described the nurses' knowledge level on MOH guidelines as moderate to good. Increasing nurses' knowledge about the guidelines could lead to better adherence.

Statistical analysis showed a significant association between training and adherence to national guidelines in severe preeclampsia management. Furthermore, there was a statistically significant association between knowledge of management and adherence to these guidelines.

B. Conclusion

The study clearly demonstrates that the level of knowledge among nurses significantly influences their adherence to Ministry of Health guidelines in managing severe preeclampsia. Higher levels of awareness and understanding of these guidelines correlate with better compliance, indicating that well-informed nurses are more likely to implement the recommended practices effectively. This highlights the critical need for ongoing education and training programs that enhance nurses' knowledge and understanding of these guidelines. Such initiatives are essential for ensuring high standards of patient care and improving outcomes in the management of severe preeclampsia. Consequently, investing in the continuous professional development of nursing staff emerges as a key strategy in promoting adherence to these vital health guidelines.

C. Recommendations

KNH should regularly assess the knowledge levels of nurses regarding these guidelines and provide individualized feedback. Identifying knowledge gaps allows for targeted educational interventions.

There is a need for KNH to develop mentorship programs and peer support groups where experienced nurses can help less experienced staff build confidence in using the guidelines. Sharing real-life cases and experiences can be particularly effective. KNH should conduct sessions to address and clarify any misconceptions about the guidelines, such as the effectiveness of certain treatments or management strategies.

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