

Evaluation of The Capacity Required to Support the Implementation Process of Integrating the Non-Clinician Staff in The Obstetric Emergency Response in Bungoma County Referral Hospital, BCRH

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Abstract- *The capacity of non-clinicians in obstetric emergencies holds significant value through prompt intervention, leveraging community insights for culturally adept responses. This study focused on evaluating the capacity required to support implementation of non-clinician integration in obstetric emergency response at Bungoma County Referral Hospital. Using a cross-sectional survey, 93 non-clinicians were sampled through questionnaires and interviews. Descriptive and inferential statistics aided analysis with stringent adherence to ethics and COVID-19 protocols. Results showed sensitization training strongly influenced integration (84.4% agreement, mean=4.45), while 44.1% agreed non-clinicians have emergency response roles (mean=4.10). Regression analysis indicated capacity ($R^2=0.158$, $\beta=0.241$, $p=0.001$) significantly influenced quality of obstetric emergency response, explaining 15.8% of variation. Capacity building positively affected non-clinicians by equipping essential emergency response skills. Non-clinicians should be capacity-built to supplement clinical service delivery, alleviating clinical burden, prioritizing patient preferences, and improving maternal and infant outcomes while reducing mortalities.*

Keywords: *Capacity Required, Implementation Process, Non-Clinician Staff, Obstetric Emergency Response, Bungoma County Referral Hospital*

I. INTRODUCTION

Globally, more than 80% of maternal deaths result from obstetric emergencies (UNFPA, 2012). Though mostly unpredictable, these emergencies can be prevented or treated in properly networked and

equipped facilities. In 2015, 303,500 women died during childbirth and 2.7 million babies died within their first month due to obstetric emergencies and complications (NFHS 4 Fact Sheet, 2017).

In sub-Saharan Africa where maternal mortality ratios (MMR) were high, only 46% accessed obstetric emergency care by skilled professionals in facilities, with the remaining 54% unaccounted for (Ameh et al., 2016). Kenya was among 11 countries contributing to 65% of all maternal deaths globally in 2008, and one of 23 sub-Saharan African countries making insufficient progress toward the fifth Millennium Development Goal (WHO, UNICEF, UNFPA and the World Bank, 2010). Reducing maternal and neonatal mortality was the primary strategy for MDG-5, to be achieved through increasing accessibility to obstetric emergency care in healthcare facilities (Tenner et al., 2019; WHO, 2015).

In Kenya, obstetric emergencies constitute principal causes of morbidity and mortality among women, with 362 maternal deaths per 100,000 live births (Ameh et al., 2016). Bungoma County recorded 488 deaths per 100,000—significantly higher than SDG Target 3.1 of 70 per 100,000 (WHO, 2015; KDHS, 2014; DHIS, 2015). Many deaths are preventable with proper emergency obstetric response.

Obstetric emergencies are life-threatening health problems for pregnant women and their babies, arising during pregnancy, labour, and birth (WHO, 2016). Globally, 10.7 million women have died from obstetric emergencies over two decades (Geleto et al., 2018), with nearly 15% of pregnancies ending in fatal perinatal complications. While maternal mortality rates have declined, changing health needs, growing public expectations, and ambitious health goals

demand better outcomes and greater social value from health systems (Kruk et al., 2018), qualifying the need for strengthening BCRH's emergency response through non-clinician integration.

Reducing maternal and neonatal mortality remains a priority in the Sustainable Development Goals (WHO, 2015). Nearly 15% of pregnancies end in fatal prenatal obstetric complications from emergencies (WHO, 2018). In 2017, approximately 295,000 women died from obstetric emergencies and complications (WHO, 2019).

Non-clinicians are hospital personnel who interact with patients but do not dispense medical advice or perform procedures (Brookings, 2014). They work behind the scenes and form an important support system without which emergency response systems would be ineffective (NAIC, OWEs Survey, 2021). As defined by WHO (2006), health workers include any person whose primary intent is to enhance health. Approximately half of healthcare workers are non-clinical staff, including patient navigators, human resource officers, record officers, maintenance officers, registration clerks, drivers, cleaners, cooks, accountants, and procurement officers.

This study focused on non-clinicians along the continuum of care for pregnant and labouring mothers, including hospital administrators, human resource staff, procurement officers, supplies officers, gatekeepers, cleaners, drivers, registration clerks, patient navigators, and accountants working in antenatal clinics, labour wards, and postnatal wards where obstetric emergencies occur.

Evidence worldwide demonstrates that investment in emergency obstetric care significantly reduces avoidable maternal and newborn deaths. This study evaluated the capacity required to support implementation of non-clinician integration in obstetric emergency response at Bungoma County Referral Hospital.

II. METHODOLOGY

2.1 Study Area

This study was conducted at Bungoma County Referral Hospital (BCRH), a level five public health

facility operating under Bungoma County Government. Bungoma County, one of three counties in former Western Province, neighbours Kakamega, Mt Elgon, Busia, Uganda, and Trans-Nzoia. The county covers 3,032 km² with a population of 1,670,570 (2019 census).

BCRH has 223 beds and approximately 800 health personnel, with doctor-to-population ratio of 1:6.7 and nurse-to-population ratio of 1:6. Non-clinicians comprise nearly half the healthcare workforce. The hospital operates 24-hour emergency medical and trauma services, blood transfusion satellite, caesarean delivery section, imaging services, and trauma care. The maternity unit, the busiest department, serves approximately 600 mothers monthly and serves as a referral centre for all Bungoma County health facilities and beyond. Obstetric emergencies are major contributors to high client numbers.

The study was conducted in maternal and newborn departments: Antenatal Clinic (ANC), Maternity ward, Postnatal ward, and Gynaecological ward (Female ward)—areas handling obstetric emergencies.

2.2 Study Design

A cross-sectional descriptive survey design was employed to describe, explain, and validate various phenomenon aspects. This design provided a statement of affairs at the time with no researcher control over variables, enabling complete situation description through data collection.

2.3 Study Population and Sample Size

The study captured non-clinicians working in the aforementioned departments from January to May 2023: hospital administrators, accountants, registration clerks, gatekeepers, drivers, procurement and supplies officers, and cleaners. The estimated population was 176.

Sample size was calculated using Fischer's formula (1998):

$$n = z^2(pq)/e^2$$

Where: n = Sample size; z = 1.96 (95% confidence level); p = 0.5; q = 0.5; e = 0.05

$$n = (1.96)^2(0.5)(0.5)/(0.05)^2 = 93$$

Ninety-three non-clinicians were interviewed.

Table 1: Sampled Non-Clinicians in BCRH

No.	Non-clinicians	Number
1	Hospital administrators	1
2	Human resource officer	1
3	Accountant	1
4	Procurement & supplies	4
5	Clerical officers	14
6	Drivers	7
7	Gatekeepers	14
8	Cleaners	45
9	Records officers	4
10	Medical engineers	2

2.4 Sampling Procedure

Purposive sampling selected participants on duty during data collection.

2.5 Data Collection

Quantitative data: 93 non-clinicians were interviewed using semi-structured open-ended questionnaires with research assistants regarding competency to identify obstetric emergency signs/symptoms, available resources and capacity for implementation, and encountered challenges.

Qualitative data: Key Informant Interviews (KII) were conducted with hospital managers and policy makers including the Medical Superintendent, Nursing Officer in charge, Obs/Gyne NO i/c, gynecologist, hospital administrators, HR officer, and procurement

officers. Focused Group Discussions (FGD) validated structured interview outcomes, exploring questions not easily answered in written surveys as integrating non-clinicians represented a new initiative.

The cross-sectional study (January-May 2022) used in-depth interviews with 93 non-clinicians. Verbal permission was obtained from hospital leadership. Participants were conveniently selected based on availability and willingness. Interviews were conducted in English and/or Kiswahili by trained research assistants using interview guides covering knowledge about obstetric emergencies, signs/symptoms, causes, attitudes about integration, experiences, fears, and decision-making. Interviews were scheduled during free time and audio-recorded with consent. Five research assistants and two independent guides conducted the interviews.

2.6 Data Analysis

Upon reaching saturation, data were checked and cleaned. Descriptive and inferential statistical analyses were performed. Data were cleaned, edited, entered into Excel database, and analysed using SPSS version 22.0. Adherence to ethics and COVID-19 protocols was stringent.

III. RESULTS AND DISCUSSION

3.1 Satisfaction Rating on Emergency Obstetric Response

Descriptive summary analysis evaluated average satisfaction on obstetric referral in BCRH. Each statement was rated on a Likert scale (1-5: Strongly Disagree=1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5). Results are displayed in Table 2.

Table 2: Rating on Emergency Obstetric Response

Statements	SD	D	N	A	SA	Mean	Mode	Std. Dev
Non-clinicians have a role in emergency response	9(9.7%)	2(2.2%)	1(1.1%)	40(43%)	41(44.1%)	4.10	5	1.189
Sensitization training facilitates integration	3(3.2%)	4(4.3%)	2(2.2%)	23(24.7%)	61(65.6%)	4.45	5	0.973
Length of stay influences performance	2(2.2%)	6(6.5%)	8(8.6%)	33(35.5%)	44(47.3%)	4.19	5	0.992

Trained non-clinicians have better understanding	5(5.4%)	8(8.6%)	6(6.5%)	26(28.0%)	48(51.6%)	4.12	5	1.187
Average rating						4.22	5	0.932

Strongly Disagree (SD)=1, Disagree (D)=2, Neutral (N)=3, Agree (A)=4, Strongly Agree (SA)=5

Results showed over 65% of respondents strongly agreed that sensitization training facilitates non-clinicians' integration into obstetric emergency response. This statement had the highest overall mean of 4.45 (mode=5, SD=0.973).

Conversely, 44.1% strongly agreed that "Non-clinicians have a role to play in obstetric emergency response in BCRH," representing the lowest satisfaction with the least overall mean of 4.10 (mode=5, SD=1.189).

Overall, emergency obstetric response had an average rating of 4.22 (mode=5, SD=0.932), clearly indicating that 84.4% of respondents agreed that non-clinicians influence obstetric emergency response at BCRH.

3.2 Linear Regression on Capacity Needed to Integrate Non-clinician Staff

Table 3: Linear Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error
1	.241	.158	.052	.50388

Model	Sum of Squares	df	Mean Squares	F	Sig.
Regression	2.657	1	2.657	10.465	.001
Residual	43.162	170	.254		
Total	45.819	171			

Model	B	Std. Error	Beta	t	Sig.
(Constant)	3.031	.402		7.545	.000

Capacity Needed	.297	.092	.241	3.235	.001
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Dependent Variable: Integration of non-clinicians in Emergency Obstetric Response

Predictors: (Constant), Capacity needed

Model summary from Table 3 showed R² value of 0.158. R² measured variability in the dependent variable (integration of non-clinicians in emergency obstetric response) the predictors accounted for. This implied that capacity needed explained approximately 15.8% of variation in quality of emergency obstetric response at BCRH. Additionally, ANOVA test was statistically significant (F=10.465, p=0.001), indicating the linear regression model had good fit and was appropriate for determining linear association between capacities needed to integrate non-clinicians in emergency obstetric response.

Furthermore, capacity needed had a linear regression standardized coefficient of 0.241 (t=3.235, p<0.05), statistically significant at 0.05 alpha level. This coefficient implied that a unit change in capacity needed would result in 24.1% increase in ability to integrate non-clinicians in emergency obstetric response at BCRH. The constant had a coefficient value of 3.031, statistically significant (p<0.05), implying that besides capacity positively influencing integration of non-clinicians in emergency obstetric response.

IV. DISCUSSION

In their study in a Northern Mozambique rural hospital, Dekker-Boersema et al. (2019) found that training non-clinicians to perform triage in ill-equipped, doctor-strained hospitals is effective when staff turnover is low. Aligned with this study, the notable presence of well-capacity-built non-clinicians indicates strong familiarity with hospital operations and obstetric care protocols.

Notably, a substantial majority exceeding 65% of respondents expressed strong agreement that

sensitization training plays a pivotal role in facilitating non-clinicians' seamless integration into obstetric emergency response systems. This helped reduce mortality rates for both mothers and newborns (Dekker-Boersema et al., 2019). This assertion garnered the highest mean rating of 4.45, underscored by a mode of 5 and relatively narrow standard deviation of 0.973, reflecting participant consensus.

Results highlighted the significance of sensitization training and perceived responsibilities of non-clinical staff in shaping efficient emergency response strategies (WHO, 2018). This insight sheds light on opportunities for enhancing integration of non-clinical personnel within the hospital's obstetric care framework.

The regression analysis demonstrating that capacity accounts for 15.8% of variation in integration quality, with a 24.1% increase per unit change in capacity, underscores the critical importance of systematic capacity building. This finding aligns with WHO (2018) recommendations for quality primary healthcare that emphasizes workforce development and competency enhancement.

V. CONCLUSION

The study demonstrates that capacity building significantly influences successful integration of non-clinicians into obstetric emergency response systems. With 84.4% agreement on the importance of sensitization training and capacity explaining 15.8% of integration quality variation, the evidence supports systematic investment in non-clinical workforce development.

Well-capacity-built and adequately supported healthcare workers, regardless of clinical background, contribute significantly to improved emergency response systems. The strong positive relationship between capacity development and integration success ($\beta=0.241$, $p=0.001$) validates the necessity of comprehensive training programs for non-clinical staff involved in obstetric emergency care.

VI. RECOMMENDATIONS

1. Emphasize supportive supervision, training, and resource availability for integrating non-clinicians to

reinforce well-capacity-built staff efforts. Adequately supported healthcare workers, regardless of clinical background, contribute significantly to improved emergency response systems.

2. Focus on policy and governance by formulating formal policies and guidelines to integrate non-clinicians into the response system, synergizing with lean conventional clinical staff. Align with national guidelines to ensure standardization and adherence to established best practices.

3. Equip non-clinical staff with essential skills, especially in modern technology, ensuring they have necessary resources to contribute toward improved patient outcomes and overall system efficiency.

4. Implement comprehensive sensitization training programs that address the specific needs and roles of non-clinicians in obstetric emergency response, given the strong positive correlation demonstrated in this study.

5. Establish continuous capacity building mechanisms including regular assessments, refresher training, and competency evaluations to maintain and enhance non-clinician capabilities in emergency obstetric care.

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