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■ Original Research Article

Availability and Utilization of Basic Emergency Obstetric and Newborn Care Services in Jigawa State, Northwest Nigeria

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ABSTRACT

Background: Maternal mortality reduction is a priority under goal 3 of the Sustainable Development Goals. The majority of maternal deaths occur from direct obstetric complications like post-partum hemorrhage, obstructed labor, toxemia of pregnancy and complications of abortion. Availability and utilization of Emergency Obstetric Care services have been shown to reduce suffering and deaths from obstetric complications. The study assessed the availability and utilization of Basic Emergency Obstetric and Newborn Care (BEmONC) services in Jigawa State, Northwest Nigeria. **Methods:** A descriptive cross-sectional study conducted among public Primary Health Care facilities that provide delivery services in Jigawa State. A two-stage sampling technique was used to select 15 public primary health care centers. Data was collected using a structured emergency obstetric care tool developed by Averting Maternal Death and Disability and analyzed using IBM SPSS version 25. **Results:** All the healthcare facilities administered parenteral Oxytocics, while 86.7% administered parenteral antibiotics and 93.3% performed neonatal resuscitation. About 53%, 74%, and 80% of the facilities performed removal of retained product, administration of parenteral anticonvulsants and manual removal of retained product respectively None of the health facilities performed assisted vaginal delivery. Only 20.3% of births took place in facilities providing BEmONC, and only 9.4% of the BEmONC needs in Jigawa State were being met. **Conclusion:** None of the health facilities met the criteria for a fully functional BEmONC. Majority of the women with obstetric complications did not utilize BEmONC services, and the BEmONC needs of the population were not being met.

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Introduction

Maternal mortality reduction is a priority under goal 3 of the Sustainable Development Goals (SDGs) agenda which aims at ensuring healthy lives and promoting well-being for all.[1] About 15% of pregnant women will experience life-threatening complications at delivery or in the post-partum period. The majority of these are direct obstetric complications such as postpartum hemorrhage, sepsis, obstructed labour, toxemia of pregnancy and complications of abortion. When these complications occur, they do so suddenly often without warning signs and can be fatal unless treated promptly.[2] Currently, the international consensus is to make all pregnancies and deliveries safe by ensuring that women who experience these obstetric complications receive the care they need and on time.[2]

The WHO guidelines recommend that for every 500,000 people, there should be five Emergency Obstetric and Newborn Care (EmONC) facilities; four offering Basic EmONC and one being a Comprehensive EmONC facility.[3] The BEmONC

signal functions include; administration of parenteral antibiotics, administration of parenteral Oxytocics, administration of parenteral anticonvulsants, manual removal of placenta, removal of retained product, assisted vaginal delivery and neonatal resuscitation.

WHO also recommends at least 15% of all births in the population take place in EmONC facilities and 100% of women estimated to have obstetric complications are treated in EmONC facilities.[4] However, studies have shown that only 2.3% of health facilities expected to provide BEmONC provide all seven signal functions in developing countries and none of the districts assessed met minimum UN coverage rates for EmONC.[5]

The estimated met need for emergency obstetric care was less than 35% in most settings in developing countries, illustrating that many women with obstetric complications do not currently have access to a health facility for appropriate care. In Nigeria, only an estimated 2% of the designated Basic Emergency Obstetric and Newborn Care facilities are able to provide all seven signal functions of Basic Emergency Obstetric and Newborn Care.[5]

Similarly, the utilization of EmONC is low in developing countries, the proportion of births which take place in EmONC facilities ranged between 9.9% and 47.5%.[5] It is likely that the non-availability of care is recognized by the population and that this too will be a strong reason for non-uptake of EmONC.[5]

Efforts to increase births at health-care facilities may not reduce maternal or newborn mortality if availability of services is insufficient. However, little evidence exists for these at health facilities caring for women and newborn babies in Jigawa State. Therefore, assessing the range of BEmONC interventions provided in health facilities is important in determining capacity to treat obstetric emergencies.[6] Furthermore, policy makers and program managers need to know if their efforts to improve the coverage of emergency obstetric services are making a difference for women who experience life-threatening complications.[1]

Assessment of performance indicators for emergency obstetric and newborn care can help to identify priorities to improve health services for women and newborns.[7] The study, therefore, aimed to determine the availability and utilization of BEmONC services in Jigawa state.

METHODOLOGY

Study Area

The study was conducted in Jigawa State, a predominantly rural state, in Northwestern Nigeria. Administratively, the State is made up of twenty-seven Local Government Areas and 287 political wards. With a 2023 projected population of 5,590,272. The State has a maternal mortality rate of 1,012 per 100,000 live births with a total life-time risk of maternal death of 1 in 15.[8] About 49% of the population are female. The State has a total of 120 primary health care Centers that provide delivery services.[9]

Study Design

It was a facility-based descriptive cross-sectional study

Study Population

The study population included public Primary Health Care facilities that provide delivery services in Jigawa State. Primary Health Care facilities that provide delivery services for less than three months prior to this study were excluded.

Sample Size Determination And Sampling Technique

A two-stage sampling technique was used to select the 15 Primary Health Care facilities that provide delivery services. Stage one involved the selection of 3 LGAs (One from each of the 3 senatorial districts of the State). Stage two involved selection of all the public PHCs that provide delivery services in the selected LGAs.

Data Collection Instrument

Data was collected using structured emergency obstetric care tools developed by Averting Maternal Death and Disability.[2] These tools were based on the emergency obstetric care indicators specified in the international guidelines for monitoring the availability and use of obstetric and neonatal services. The questionnaire was adapted to the context of the healthcare system in Jigawa state.

Data Management

Data was analyzed using IBM SPSS version 25. Results were presented with tables and charts. The availability of BEmONC services was measured by the number of facilities that perform the complete set of seven signal functions in relation to the size of the population. When the facility offered the seven signal functions of BEmONC in the three months before the assessment, the facility was considered a fully functioning Basic Emergency Obstetric Care facility.

The facility was considered BEmONC-1 if it performed six signal functions, BEmONC-2 if it performed five signal functions, and BEmONC-3 if it performed four signal functions three months prior to the survey. A facility that performed less than 4 signal functions was considered nonfunctional for Basic Emergency Obstetric Care.[10] The following formulae were used to assess availability of Basic emergency obstetric and Newborn care:

a) Proportion of Basic Emergency Obstetric and Newborn Care facilities

$$= \frac{\text{Total number of facilities that meet EmONC criteria}}{\text{Total number of facilities surveyed}} \times 100$$

b) Basic Emergency Obstetric and Newborn Care coverage per 500,000 population

$$= \frac{\text{Number of BEmONC facilities x 500,000}}{\text{Catchment area population}}$$

c) The Basic Emergency Obstetric and Newborn Care coverage

$$= \frac{\text{Total number BEmONC facilities}}{\text{Minimum number of BEmONC facilities required}} \text{ x } 100$$

Frequency tables, graphs and maps were used to present the availability and coverage of Basic Emergency Obstetric Care facilities.

Utilization of BEmONC services was assessed by measuring the proportion of births taking place in BEmONC facilities and met needs BEmONC services as follows;

a) Proportion of births taking place in BEmONC facilities

To get the proportion of all expected births in an area that take place in BEmONC health facilities. The numerator is the number of women registered as having given birth in facilities classified as BEmONC facilities. The denominator is an estimate of all the live births expected in the area, regardless of where the birth takes place (using the crude birth rate for the area estimated from the total population).

Proportion of births taking place in Basic emergency obstetric care facilities

$$= \frac{\text{Total number of births recorded at BEmONC facilities}}{\text{Total number of births estimated for the area}} \times 100$$

The total number of births was estimated from the total population of the study area using a crude birth rate of 34/1000 in urban areas and 42/1000 in rural areas as provided by national demographic and health survey 2018.

a) Total number of estimated births

$$= \frac{\text{Total projected population for the area} \times \text{crude birth rate}}{1000}$$

The proportion of all births taking place in Basic Emergency Obstetric and Newborn Care facilities were presented in tables.

b) Met needs for Basic Emergency Obstetric and Newborn Care

'Met need' is an estimate of the proportion of all women with major direct obstetric complications who are treated in a health facility providing BEmONC. The numerator is the number of women treated for direct obstetric complications at emergency care facilities over a defined period, divided by the expected number of women who would have major obstetric complications, or 15% of expected births, during the same period in a specified area. The direct obstetric complications that were included in this indicator were: hemorrhage (antepartum and postpartum), prolonged and obstructed labor, postpartum sepsis, complications of abortion, severe pre-eclampsia and eclampsia, ectopic pregnancy and ruptured uterus.

Met needs for Basic Emergency Obstetric and Newborn Care =

$$\frac{\text{Number of obstetric complications treated in BEmONC facilities}}{\text{Total number of expected complications in the area}} \times 100$$

RESULTS

A total of 15 facilities were assessed. Overall, none of the health facilities performed all the seven BEmONC signal functions to qualify as a fully functional BEmONC facility. Majority (46.6%) of the facilities performed only five BEmONC signal functions and classified as BEmONC-2 facilities. Thirteen percent of the facilities were nonfunctional for Basic Emergency Obstetric Care (Figure 1)

All the healthcare facilities reported administering parenteral Oxytocics, while 86.7 administered parenteral antibiotics. Up to 93.3% of the facilities performed neonatal resuscitation. None of the health facilities performed assisted vaginal delivery. Only 46.7% of the facilities ran 24-hour obstetric services. Seventy-three percent have a minimum of two nurses or midwives. (Table 1)

Using the BEmONC-3 standard, all three LGAs had BEmONC coverage above the minimum recommended four per 500,000. The Basic Emergency Obstetric and Newborn Care coverage per 500,000 was 7.7 for Jigawa state. (Table 2). Also, all the LGAs had a BEmONC coverage of above 100%. The cumulative BEmONC coverage was 192.5%. (Table 3).

Only 20.3% of expected births took place in Basic Emergency Obstetric and Newborn Care facilities in Jigawa State. (Table 4). Only 9.4% of the Basic Emergency Obstetric and Newborn Care needs were met in Jigawa State. (Table 5).

Table 1: BEmONC Service Availability in Jigawa State (n=15)

Variable	Frequency (%)
Parenteral Oxytocin	15(100)
Neonatal resuscitation	14(93.3)
Parenteral antibiotics	13(86.7)
Manual removal of placenta	12(80)
Parenteral anticonvulsants	11(73.7)
Removal of retained product	8(53.3)
Assisted vaginal delivery	0(0.0)

Table 2: BEmONC Coverage per 500,000 Population in Jigawa State

LGA	Projected population	BEmONC facilities	BEmONC coverage per 500,000
Hadejia	171,136	5	14.6
Kazaure	228,771	3	6.5
Dutse	443,885	5	5.6
Jigawa State	843,792	13	7.7

Table 3: BEmONC Coverage in Jigawa State.

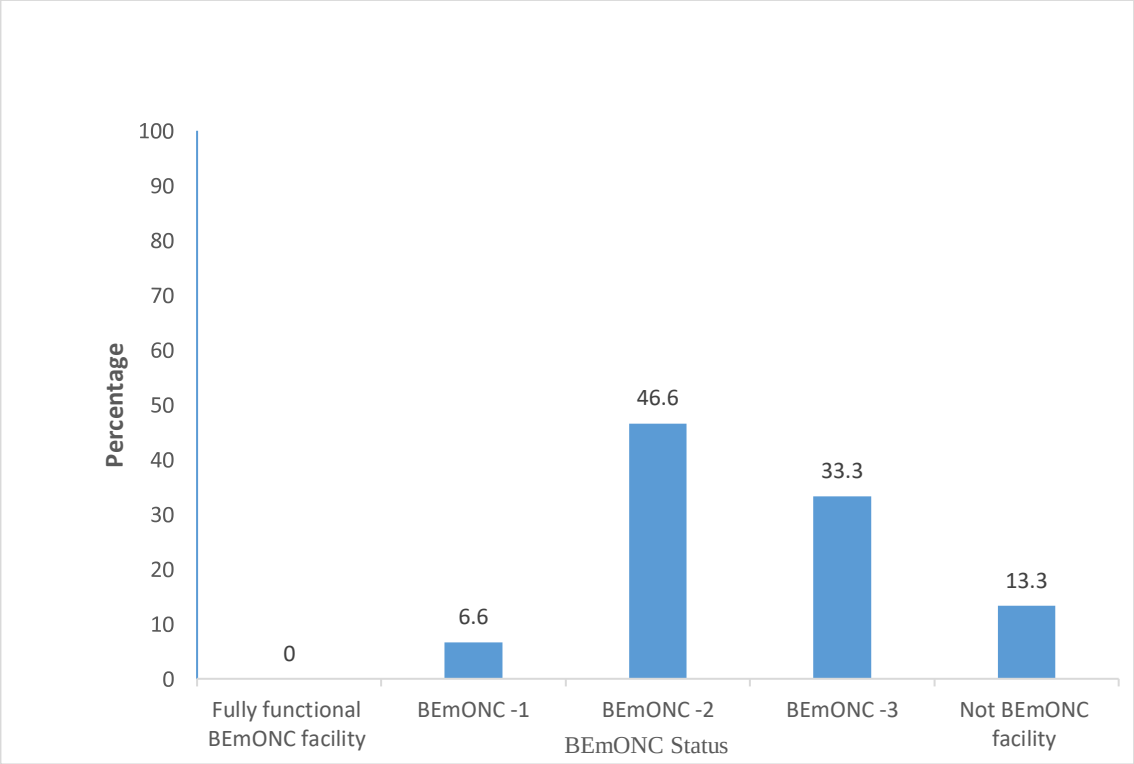
LGA	Population	Total BEmONC facilities	Minimum BEmONC facilities required	BEmONC coverage
Hadejia	171,136	5	1.37	364.9
Kazaure	228,771	3	1.80	166.0
Dutse	443,885	5	3.55	140.8
Jigawa State	843,792	13	6.75	192.5

Table 4: Proportion of Birth Taking Place in BEmONC Facilities in Jigawa State

LGA	Total births in BEmONC facilities	Projected population	Estimated births	Proportion of births in BEmONC facility (%)
Hadejia	989	171,136	1,796	55.1
Dutse	589	443,885	4660	12.6
Kazaure	223	228,771	2,402	9.2
Jigawa State	1801	843,792	8859	20.3

Table 5: Met Needs for BEmONC Services in Jigawa State

LGA	number of complications treated in BEmONC facilities	number of expected complications	Met needs of BEmONC (%)
Hadejia	52	269	19.3
Dutse	54	699	7.72
Kazaure	19	360	5.27
Jigawa State	125	1328	9.41



DISCUSSION

Overall, the study found none of the facilities qualified as fully-functional BEmONC facility, while majority of the health facilities only qualified as BEmONC -2 facilities. Thirteen percent of the health facilities performed less than four signal and hence did not qualify to be classified as a BEmONC facility. Similar findings were reported from Studies in Ibadan,[11] South-South,[12] Kaduna[13] and Zaria[14] all in Nigeria. They used the UN framework for assessment of availably of BEmONC and reported that none of the health facilities performed all seven signal functions of BEmONC. These studies also reported that none of the the health facilities performed all seven signal functions of BEmONC. These studies also reported that none of the health facilities performed assisted vaginal delivery three months prior to the survey while the majority of

the health facilities administered parenteral antibiotics and anticonvulsants.[11-14] A study from South Africa which assessed BEmONC services in 12 districts also reported that none of the health facilities provided all the seven BEmONC signal functions although up to 98% provided assisted vaginal delivery three months prior to the survey.[15] Similarly, a study in six developing countries of Kenya, Malawi, Sierra Leone, Nigeria, Bangladesh and India found that only 2.3% of the facilities performed all seven-signal functions.[5] None of the health facilities in Kenya, Sierra Leone and Bangladesh performed all BEmONC signal functions. This finding implies that the women lack access to the full component of BEmONC services especially assisted vaginal deliveries with consequent negative effects on maternal health outcomes.[16] It also indicates a significant unrealized potential in the provision of BEmONC services in Jigawa State.

The study also revealed that administration of parenteral antibiotics and anticonvulsants were the most frequently performed signal functions while assisted vaginal delivery was the least performed signal function.[5] Another similar finding as reported in a study from Madya Pradesh, India, found that, none of the facilities performed all seven BEmONC signal functions.[17] Assisted vaginal delivery was not performed by any of the facilities while parenteral antibiotics and anticonvulsants were administered by more than 80% of the facilities.[17] The similarity of findings from these studies could be because all the studies were conducted in developing countries, which have been shown to have poor service availability as it relates to Basic Emergency Obstetric Care services.[5,16]

However, contrary findings were reported from two cross-sectional studies in Bauchi State Nigeria, on strengthening quality of EmONC signal functions found that 18.4% and 10.2%[18] of all the facilities performed all the seven signal functions of BEmONC services. They also found that 23.7%[18] and 17.9%[18] of the facilities performed assisted vaginal delivery three months prior to the survey. Bauchi State government with the support of the Targeted States High Impact Projects (TSHIP) had implemented an intervention towards improving availability of Emergency Obstetric Care services from the year 2015 prior to the studies.[18] This could explain the difference between the findings of this study and the Bauchi studies. Other contrary findings were reported from studies in Ghana,[6] Tanzania,[19] Pakistan [20] and India,[21] which found that 12.5%, 10%, 21% and 11.1% of the health facilities performed all BEmONC signal functions respectively. The studies from Ghana and Pakistan also reported that up to 80% and 79% of the health facilities performed assisted vaginal deliveries, respectively.

The findings of BEmONC coverage 7.7 per 500,000 population and 192.5% in this study is above the WHO recommendation of four per 500,000 population and 100%. However, this seemingly good coverage is based on at least a BEmONC-3 facility as none of the facilities provided all the BEmONC services as described. Similarly, a cross sectional study in Kaduna State Nigeria assessed availability of BEmONC services in three communities found that the BEmONC coverage was more than the WHO recommended minimum of four per 500,000.[13] Two studies from Tanzania also reported a BEmONC of more than the recommended minimum in all the districts surveyed.[22,19]

A study in Xianji Province, China reported a BEmONC coverage of 5.5 per 500,000 population in districts surveyed.[23] The reason the BEmONC coverage in this study is higher than the recommended four per 500,000 could be because of a recent drive by the state government to provide at least a functional Primary Health Care facility in every ward.[24] In contrast to the findings of this study, studies from Bauchi[25,18] and another from South South,[12] all in Nigeria reported that the BEmONC coverage was less than the recommended minimum of four per 500,000 population. In addition, another study from Ibadan, Nigeria reported that the BEmONC coverage was 1.2 per 500,000 population.[11]

A multi-country study conducted in three African countries of Ethiopia, Uganda and Tanzania reported the BEmONC coverage in all the districts where less than the recommended coverage of four per 500,000.[26] Similarly, studies from India[27] and Pakistan[21] using the UN process indicators for emergency obstetric care assessed 444 hospitals in 12 districts and reported a BEmONC coverage of 1.4 per 500,000 and 1.6 per 500,000 respectively. This finding implies that there is a great potential towards improvement of BEmONC services in Jigawa State as the facilities coverage is more than the minimum recommendation. The potential can be achieved by improving service availability in the already more than adequate number of health facilities providing the BEmONC

This study found that a little more than one-fifth of expected births took place in BEmONC facilities, which is slightly above the initial recommended 15% by the Averting Maternal Deaths and Disability (AMDD). However, countries have continued to review the minimum standard with some aiming at close to 100% of all expected births to take place in facilities where obstetric emergencies can be treated.[2] This means, therefore, that only one-fifth of deliveries in this study took place in health facilities where obstetric emergencies could be treated. As obstetric emergencies are not so predictable, this portends threat to lives of the pregnant women. Similarly, a study on maternal and newborn care in Sub-Saharan Africa conducted in three African countries reported a proportion of births in BEmONC facilities of 18% in Tanzania and 13.4% from Ethiopia.[26] Also, studies from India[21] and Pakistan[28] reported that the proportion of births that took place in BEmONC facilities were 26.2% and 24% respectively.

Much lower proportions were reported from various studies in Nigeria;[14,18,11, 12] Eight percent was

reported from a study in Zaria, Nigeria,[14] 8% from Bauchi State Nigeria,[18] 3.1% from Ibadan, Nigeria[11] and 2.2% from Gokana in South-South Nigeria.[12] Also, A cross sectional study conducted in Four African countries of Kenya, Rwanda, South Sudan and Uganda reported a lower proportion of between 0.6 to 8%.[29] Similarly, studies from Tanzania[30] and Ethiopia[31] reported proportions of 2% and 3% respectively. The higher proportion of births in BEmONC facilities assessed by this study compared to the other studies in Nigeria and Africa could be because of the deliberate effort put in by the Jigawa State government towards providing emergency transport services to pregnant women with obstetric complications to be transported to the nearest health facility.[32]

This study also reported a met need of BEmONC of 9.14%which is far less than the 100% recommended for met needs of BEmONC. This is not surprising despite the good BEmONC coverage and fair physical accessibility because the full complement of BEmONC services were not available in the health facilities as none of the facilities provided all the services three months prior to the survey. A facility-based cross-sectional study from Zaria, Nigeria which assessed utilization pattern of EmONC services using seven health facilities, reported met needs of 25.1% for BEmONC services.[14]

Similarly, low met needs of BEmONC were reported by two cross-sectional studies from Bauchi State, Nigeria which reported met needs of 9.9%[18] and 3.9%[25] respectively. Also, a study from Ibadan in southern Nigeria reported low met needs of 15% for BEmONC services.[11] Similarly, a study conducted in Kenya, Rwanda, South Sudan and Uganda found a met needs of between 2.1-18.5%.[29] As met needs are not only a factor of service availability but also affected by health-seeking behavior, it is understandable that the figures are low from many studies in Nigeria including this study because poor maternal health-seeking behavior has been reported especially in rural communities in Nigeria.[33] This is further compounded by the poor maternal health service provision in Nigeria.[5] A much higher met needs was however reported from a study in Tanzania which observed a met needs of 94.5% in all the districts surveyed.[3]

A major strength of this study is the use of total population survey of the health facilities that provide delivery services in the selected LGAs to assess availability of services. The study however did not answer the questions of quality of the BEmONC services in the health facilities and client satisfaction with the services provided. Future research directions should explore the quality of BEmONC services and client satisfaction with BEmONC services in Jigawa state.

CONCLUSION

None of the health facilities met the criteria for a fully functional BEmONC facility while majority of the facilities met the criteria for a BEmOC-2 facility. Using at least a BEmOC-3 as a standard, the coverage of BEmONC facilities per 500,000 population was above the recommended. Only one-tenth of the BEmONC needs of the population were met. Therefore, the Jigawa State government through the State Primary Health Care Development Board should provide adequately equip designated BEmONC facilities and merge some BEmONC facilities in line with WHO minimum recommendations rather than having more than enough facilities without full the complement of BEmONC signal functions.

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