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Research

Analyzing Maternal Mortality in Nigeria: A Qualitative Study Approach using the Three Phases of Delay

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ABSTRACT

Background: Nigeria has a Maternal Mortality Ratio of 814 per 100,000 births. Only 30% of births in Nigeria occur in health facilities. A proven method to prevent maternal deaths is to provide emergency obstetric care and promote hospital birth. Application of the Three Phases of Delay Model to hospital births in Nigeria directed a community needs assessment and may influence local and regional health promotion efforts with the goal of preventing maternal deaths. This study aimed to analyze maternal deaths in Nigeria, employing a qualitative approach with the Three Phases of Delay model.
Subjects and Method: This was a qualitative study grounded theory research that employed focus groups and key informant interviews in Cross River State, Nigeria. A stratified random sampling of local government areas was followed by a random selection of wards and purposive selection of key informants and focus group participants. In total 26 key informants and 100 focus group discussion participants were selected across the wards in accordance with local customs. All respons were recorded digitally and transcribed verbatim. All key informant interviews and all but two focus groups were conducted in English. Data were collected in December 2016, over a four-week period. The transcripts were analyzed using Atlas TI to designate codes and to compile quotes by theme.
Results: Application of the Three Phases of Delay Model to hospital births in Cross River State, Nigeria found significant points of delay at all levels of the Delay Model. The most prevalent of the delays described by the focus groups and key informants were delay in reaching the point of care and delay in receiving quality care at the health facility. .
Conclusion: Identifying the influences on delay can be employed to develop and plan local and regional health promotion efforts with the goal of preventing maternal death.

Keywords: maternal mortality, childbirths, pregnancy, delay model, health facility.

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BACKGROUND

Progress towards reducing maternal mortality levels has been recorded across various countries (Meh et al.,2019). Although there has been a decline in maternal deaths, Nigeria remains one of the Sub-Saharan countries where maternal mortality has been a problem with suboptimal maternal and

child health services (Alkema et al., 2016). The country's progress towards reducing maternal deaths has been insufficent as Nigeria ranks fourth among all nations of the world in terms of Maternal Mortality Ratio: 814 per 100.000 births, just below Sierra Leone, Central African Republic and Chad (Bongaarts, 2016). Only 30% of births in Nigeria occur in health facilities and are attended by doctors, nurses, or midwives (WHO, 2017).

The lifetime risk of a woman dying in Nigeria during pregnancy, childbirth, postpartum or post-abortion is 1 in 22, this is in large contrast to the lifetime risk as reported in the developed nations of the world (WHO, 2020). Consistent with major causes of maternal mortality worldwide, 70% of maternal deaths in Nigeria are due to one of five complications included hemorrhage, infection, unsafe abortion, hypertensive diseases of pregnancy, and obstructed labor (Nigeria Demographic and Health Survey, 2018).

The country's progress towards reducing maternal deaths has been largely suboptimal (Alkema et al., 2016). Women bleed to death en route the hospitals and others die of infections acquired delivering at home, in church or at ill-equipped Primary Health Centers (Adebowale et al., 2012). Some die of prolonged labor without access to a qualified surgeon, and others due to spikes in blood pressure (NDHS, 2018). Evidence has it that the high rate of maternal and child mortality recorded in Nigeria is strongly corroborated with the three phases of delay as proposed by Thaddeus and Marine (Okonofua et al., 2018). These barriers include delay in making decision about seeking maternal healthcare, delays associated with finding and arriving a medical facility, and delay in receiving quality healthcare when a woman finds and arrives a healthcare facility (Okonofua et al., 2018).

Based on evidence from literature, a proven method to prevent maternal mortality is to ensure availability of emergency care to mothers during delivery. However, delayeys at various stages have constituted impediments to achieving this improvement to maternal health and resulted in preventable maternal mortality. Therefore, this study aimed to analyse maternal deaths in Nigeria, employing a qualitative approach with the Three Phases of Delay model to identify the influences and to develop and plan local and regional health promotion efforts with the goal of preventing maternal deaths.

SUBJECTS AND METHOD

1. Study Design

This study uses a cross sectional descriptive research design, grounded theory, qualitative analysis is part of a broader study of the influences on maternal mortality.

This approach facilitates the flexible expression of ideas and experiences that might be left behind in the development of structured interview formats, and the collection of iterative data and study question formats allows a thorough exploration from the participants perspective, which makes it impossible to use quantitative methods (Paramita and Kristiana, 2013; Afiyanti, 2008; Indrizal, 2017).

This study was conducted at Cross River State, Nigeria, in December 2016. The data collection was done over a four-week period in December, 2016 in six (6) Local Government Areas of the state.

2. Study Informants

The selection of informants in this study uses simple random sampling, two focus groups and 5 key informant interviews in each of 6 wards, were scheduled by Master of Public Health (MPH) students of the

University of Calabar in accordance with local customs, which is the technique of determining samples with certain considerations/criteria included included women of childbearing age, men, traditional birth attendants, and nurses.

In total, 6 groups of women of childbearing age, 2 groups of men, 2 groups of traditional birth attendants, and one group of nurses, 100 focus group discussion participants described their experience with maternal death. Wards within local government areas were selected using a stratified random design. Most discussions and interviews occurred in Primary Care Facilities. The researchers also conducted 26 key informant interviews of local political leaders, medical and public health professionals, traditional birth attendants, nurses, and midwives. A total of 26 key informants contributed their opinions and experiences with maternal death.

Key informants included government officials, health professionals, traditional birth attendants, and leaders of faith communities.

3. Operational Definition of Variables

Maternal mortality is the death of a woman during pregnancy or within 42 days of termination of pregnancy, irrespective of duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Hemorrhage is heavy bleeding during or after childbirth which can lead to drop in blood pressure and shock if not managed.

Eclampsia is a condition in which one or more convulsions occur in a pregnant woman due to high blood pressure, often followed by coma and poses a threat to the mother and baby's health.

Efficiency of medical personnel is making the right eye assessment, diagnosis and treatment to improve the eye health condition of an individual by medical eye care staff.

Fever is defined for a pregnant women or woman in labor as a temperature of 38oC or more.

Young maternal age is defined as pregnancy before the age of fifteen years, just outside the reproductive ages of 15-49 years as defined by the World Health Organization.

Poverty is defined as the state of a woman, or her family being exteremely poor, such that basic provisisons for maternal health can't be afforded.

4. Data Analysis

Data analysis in this study uses content analysis. These themes can be identified, coded inductively (data driven) from raw qualitative data (interview transcripts, biographies, video recordings, etc.) as well as deductively (theory driven) based on theory and the results of previous study. In this study only uses one type of analysis, namely cotent analysis.

All responses were recorded digitally and transcribed verbatim. All key informant interviews and all but two focus groups were conducted in English. One focus group was translated from Efik and a second was translated from pidgin English by MPH students from the University of Calabar. Segments of the transcribed data that answered the research questions were selected, and saved as quotations and themes. Organizing the list of codes and themes into grouping was necessary as it helped us establish overarching themes and categories and to identify similarities. The transcripts were analyzed using Atlas TI to designate codes and to compile quotes by these themes.

RESULTS

Sociodemographic characteristic of participants

There were 12 (46%) male and 14(54%) female, key Informants as well as 22 (22%) and 78 (78%) male and female Focus Group Discussants, respectively (Table 1).

The study found significant points of delay at all levels of the Delay Model. The most prevalent of delays described by the focus groups and key informants were delay in reaching the point of care and delay in receiving quality care at the health facility.

Table 1. The characteristics of Study informants

Characteritics	Key Informants		Focus Group Discussion	
	n	%	n	%
Male	12	46%	22	22%
Female	14	54%	78	78%
Average age (years)	47±2.12		26±2.41	
Average Family Size	4.73		2.71	

Perceived Causes of Maternal Death

The majority of the respondents recounted a maternal death due to hemorrhage. Others mentioned infection, retained placenta, high blood pressure, prolonged labor, and illegal abortion. These responses correspond directly with the leading medical causes of maternal mortality worldwide, and in Nigeria. Additional perceptions included prophecy, spiritual attack and dysfunctional relationships within the family.

Hemorrhage

"There is a woman in our area, she died at childbirth in Calabar last year due to excessive bleeding after childbirth (woman in Yakurr)."

"Two years ago, a woman I know died after childbirth due to excess bleeding. The baby lived but the woman herself died (Woman in Yakurr)."

"Two months ago, a woman died due to excessive bleeding after birth, she gave birth to twins who are both alive while she died (Woman in Yakurr)."

High Fever

"I remember about two persons. One of them died due to very high fever while the other died from very serious infection due to where she delivered her baby (Woman in Akpabuyo)."

Phase one: Delay in identifying complications and the degree of birth preparedness

The first level of delay occurs at the household or community level. The underlying factors that influence a delay in seeking preventive care or assistance during delivery occur in the community. Girls become pregnant too young. Some seek illegal abortions. Gender inequity works against empowerment of women to demand care. Some refuse antenatal care. Poverty contributes to lack of health education, adequate food and availability of health care services. Conflicting beliefs regarding supernatural causes of maternal death also contribute to delay or refusal to seek assistance from trained doctors and nurses. "

Illegal abortion:

"*The woman who died yesterday was the cause of her own death. She hid her sickness when she took in, she didn't tell her parents but rather went behind to take wrong drugs that was the cause. It was not the health Center's fault or her mother's*

fault. She failed to come out open. She wanted to abort the baby (Village Chief)."

Young maternal age:

"A friend of mine got pregnant as a child and when she went to deliver, she and the baby died. They said she is not up to the age of delivery (Woman in Etung)."

Refused antenatal care:

"A woman in 2005 died because she was not taken care of during pregnancy, her husband refused to take care of her … and did not go to register her for ANC and thus caused her death (Man in Yakurr)."

Poverty:

"Some women when pregnant can't come to the hospital for immunization, she can't even eat good food and stays at home because if a woman does not eat good food, she may die during delivery due to lack of strength (Woman in Mbube)."

"A lady in my place had no money to care for herself, she had over bleeding after delivery and she thought so much, before they could get her to the hospital, she dies (Woman in Mbube)."

Problems in the home:

"Most women die in labor because she may not be happy in her home due to problems at home and this makes her start bleeding during labor, it may not be CS, just normal labor and she will bleed and bleed that even with drugs given to her to make her stop, it may not be effective. This is because, her heart can't carry what she is going through, we may end up losing the woman. Also, most women go through a lot in their homes, their husbands don't make them happy, no food, no money, nothing! Most of these men, when they get a woman pregnant, they will leave them and go for another woman. These being complications and you may see the woman not surviving it (Religious Leader)."

Phase Two: Delay in making the decision to seek help

The second level of delay occurs when nurses at the Primary Health Center, traditional birth attendants or family members attending a home delivery do not refer the laboring or hemorrhaging woman to the hospital in time to save her life. Their delay may be due to lack of training, lack of diagnostic equipment, or the absence of an infrastructure for the referral to be completed and the woman actually reaching a trained professional in time. Occasionally, the woman herself refuses to go to the hospital due to fear or lack of money.

No referral system from Primary Health Center:

"*My cousin from Unyanga, his wife died during labor in 2009 in the health center at my place, her name was Monica (Woman in Bekwerra)."*

No referral from TBA:

"My cousin's wife died this year April after delivering with a TBA, she put to bed normally but died after one week due to excessive bleeding. She had believed that according to a prophecy, she would die if she went to the hospital. Her husband wanted to take her to the hospital for blood transfusion but she refused and died after one week but the baby survived (Woman in Akpabuyo)."

Lack of money:

"A friend of mine and a neighbor, she didn't have money for the hospital and that the requirements

were much. She decided to patronize TBA and put to birth normally but died after four days (Woman in Akpabuyo)."

Home delivery

"I witnessed a case when a lady put to birth at home and stayed for about an hour when she was rushed to the hospital, the woman delivered safely and was rushed to a health facility due to her retained placenta, the doctor helped and succeeded in bring out the placenta but the woman bled to death (Woman in Mbube)."

Refused to go to hospital:

"A woman I know that died. She died due to over bleeding and she died with the baby. She was asked to go to the hospital and she refused, saying that she can care for herself. She gave up with the baby in the process (Woman in Mbube)."

"Some would just stay in their rooms and won't call anybody to come help them until it reaches injury time and they will begin to look for vehicles to take you to the hospital. It may be at midnight (TBA in Etung)."

"Some die out of carelessness, they won't go to the clinic, they won't see a doctor and they will rely so much on us who are not well trained. So even if they are advised, they still refuse to go and when time reaches, they will stay at home for long labor, it causes death (TBA in Etung)."

Phase three: Delay at reaching the point of care

The third level of delay occurs in transit from the site of referral to the hospital. The hospital may be at a distance from the referral site and the roads may prohibit transport. All but one of the Primary Health Centers that we visited had no ambulance. The women who were referred to the hospital due to excessive bleeding, prolonged labor or retained placenta were put on the back of a motorcycle driven by volunteers from the village. There is often no assistance for a woman in labor at night, roads are impassible and many health facilities are closed or unstaffed in the evening. Another factor is that some labors progress too rapidly for transportation to the hospital.

Lack of hospital care:

"It happened last year, about five women got pregnant, due to lack of hospital care during pregnancy, when they went for delivery, they died during childbirth. It is too bad. We need something to be done to stop this. We need successful delivery of a woman (Man in Akpabuyo)."

Illegal abortion:

"A lady I know died during pregnancy and her baby died with her due to bleeding and also because she injured herself with some drugs while trying to get rid of the pregnancy. She could not make it to the hospital (Man in Yakurr)."

Turned away from hospital:

"The one I witnessed was that the lady was in labor, and she was told when she got to the hospital that her delivery time had not reached, she had to go back home. She was my friend. When she went back, the thing disturbed her so much and she tried and tried, before she could be rushed back to the hospital, she was already weak and in the process of trying to push, she gave up. She was operated upon and the baby removed (Woman in Etung)."

No time to get to hospital:

"*My brothers child labored and after she delivered, she had retained placenta and before she could be rushed to the hospital, she died (Woman in Etung).*"

"I witnessed one in my mother's place, she was about nineteen years and was pregnant, she started bleeding all of a sudden and she said it is up to her delivery time, she died before she could be rushed to the hospital due to excessive bleeding and she was operated upon and the child and her were buried (Woman in Bekwerra)."

"Another lady also died three weeks ago, she was in her place and was doing some work, as she stood up, her babies two of them came out of her and before she could be rushed to the hospital, the woman died (Man in Yakurr)."

"My neighbor, she was not in labor and felt somehow, she went to a TBA who said it was labor, before the woman could get hand gloves to check her, she struggled and before she could be rushed to the hospital, she died. Another one I have witnessed, before a lady could be rushed to the hospital, she died (Woman in Etung)."

Level four: Delay in receiving quality care at the health facility

The fourth level of delay occurs at the hospital. In Nigeria, the woman in labor and her family are asked to bring the necessities for the delivery including, hand gloves, cotton sponges, a wrapper to cover the woman in labor and often donated blood in case of surgical delivery. If they arrive without the items, they can be turned away from the hospital. If they don't have the money, up front, for surgery, they may be turned away. During or after Cesarean section (CS), which is a life-saving tool in most places, the women may die because the labor was not monitored according to international standards. The widespread fear of CS and familiarity with maternal deaths as a result of CS also contributes to refusal of surgical delivery.

Turned away from hospital:

"One my aunties died due to lack of medical personnel to care of her during delivery. The reason according to them was that she didn't come with the required necessities for labor and delivery and before they could gather those things needed for her delivery, she died leaving behind other children and her husband (Woman in Akpabuyo)."

No money for surgery:

"My uncle's wife required surgery and she had no money to go for CS and she died (Woman in Bekwerra)."

Did not recover from surgery:

"A good friend of my just died few months ago inside the hospital. She went through CS and the baby survived but she could not regain her consciousness and after a while, she died. She had a baby before that, so, she left behind those two kids. The family is very much in pains because she was a health worker and died in the hospital she was working in (Woman in Akpabuyo)."

"The second is that a woman died after surgery before they could bring out the baby, both died (Woman in Mbube)."

Refused surgery:

"A pregnant woman I know died three years ago because she refused to give birth through CS since nobody in the family had ever done a CS, and it is against her beliefs, even after the

doctor had advised her. She was my family member and she left behind her child, husband, parents and siblings (TBA in Duke Town).

Maternal death is all too familiar to the communities in Cross River State, Nigeria. The death of a mother affects her infant, other children, husband, family and community. Many of our research participants were raising the children left behind when the mother died. The community members are concerned and seek answers.

"We are just sorry that it has happened. Everybody begins to ask why? This is a traditional setting; here, people will want to know who is responsible. If she had quarreled with someone, people's eyes will be on the person. Why should she die? Becomes the question when it is just because she couldn't deliver safely because of her tight waist. Nobody wants to hear those things. The elites will listen and understand but the traditionalist will be like 'Why should she die? Why must it be my wife?' There are a lot of things (Clan Head)."

Figure 1. The three levels of delay explained with diagrams
Sources: Piane, (2018)

Figure 1 showed that the Three Phases Of Delay Model, when a woman in labor delays seeking quality maternal care, the consequences are often fatal (Bassey *et al.*, 2016). The Three Phases of Delay Model (Thaddeus and Maine, 1994) categorizes the de-

lays. The first level involves a delay in identifying complications and the preparedness of the mother and family for the birth which is usually at the household or community level. The second level is the delay at reaching the point of care, thus involving issues of logistics and transportation. The delay in receiving quality care at the health facility is the third level.

In a study carried out by Ghebrehiwet and Morrow (2010) in Eritrea, a fourth level was added between the first and second levels involving delay in making the crucial decision to seek help. The Eritrea study and another similar study in Nigeria showed that the health facility-based delay accounted for the majority of deaths (Omo-Aghoja et al., 2010). As such, by including the voices of community members, the current qualitative analysis adds more expert knowledge to the use of the delay model.

DISCUSSION

This application of the Three Phases of Delay Model to hospital births in Cross River State, Nigeria found significant points of delay at all four levels. The model is the recognition of the complex and interconnected nature of factors that constitute barriers to effective delivery of optimum maternal healthcare services (Thaddeus and Maine, 1994). Our findings revealed that most women do not receive effective health education regarding contraception, antenatal care and the need to deliver in hospital. Also, the social determinants of maternal mortality, poverty, gender inequality and belief in supernatural causes also need to be addressed. Similar findings were reported by Sk et al., (2019) in their study to contextualize the socio-cultural factors that were associated with maternal death in India.

They reported that these delay factors play phenomenal roles in the road to maternal deaths in the country (Sk et al., 2019). Skilled health professionals who can stabilize the patient and who know when to refer must be in every village. The World Health Organization had recommended that it is particularly important that all births are attended by skilled health professionals, as timely management and treatment can make the difference between life and death for both the mother and the baby (WHO, 2016).

An available ambulance and well maintained roads can save many lives. Identifying the influences on delay can be employed to develop and plan local and regional health promotion efforts with the goal of preventing maternal death. For instance, there is need to understand who is responsible for taking decisions as to where a woman delivers and when she goes, especially for emergency obstetric care. Several studies have shown that male partners usually play key roles in decision making towards maternal care seeking and delivery options (Upadhyay et al., 2012; Kakaire et al., 2011).

The most prevalent of the delays described by the focus groups and key informants were delay in reaching the point of care and delay in receiving quality care at the health facility. One primary health center used volunteers with motorbikes to transport pregnant or postpartum women in an emergency. It has been reported that in many settings, public transportation are usually unavailable and may not be accessible in times of obstetric emergencies and if available, may take a lot of time considerable time to arrive at the health facility (Pacagnella, 2012). In low socio-economic settings, studies showed that people may prioritize earning daily wage over transportation expenses for reaching health facility at times of obstetric complications (Yunus and Kauser, 2013).

Pregnant women require health care services closer to them or promptly accessible affordable public transport as a solution for the type 2 delay (SK et al., 2019). Furthermore, our findings revealed that the roads were in disrepair and motorists do not travel after nightfall. The lucky woman who arrives safely at the hospital may be turned away if she does not bring her own medical supplies. The hospitals are severely understaffed and have limited supplies and equipment. So even if she is admitted, she may face a delay in receiving quality of care. Findings from this study showed that phase three delay is directly indicative of poor quality of care and it is also reflected in other studies (Thaddeus and Maine, 1994).

Poor staffing, shortages of essential drugs, lack of blood products or equipment or supplies were identified as significant barriers to receive adequate care in the study by Mgawadere et al., (2017). Women should not be turned away from the hospital for lack of money, blood or other items. Finally, the hospitals need to be staffed by skilled doctors and nurses and have the proper equipment necessary to provide emergency obstetric care in a timely manner.

Based on the results from this study, the four phases of delay were implicated in the rate of maternal death in the study area. One of the essential components of public health program planning is conducting a thorough needs assessment (Yunus and Kauser, 2013). While global, national and regional data can illuminate the health issue, it is necessary to include the local community and have them participate in the plan. Qualitative grounded theory research in the form of focus groups and key informant interviews bring the local voice into the planning process. In addition, this research applies the Three Phases of Delay Theory in assessing community needs for essential maternity services.

AUTHOR CONTRIBUTION

GinaMarie Piane conceptualized the research in her proposal for a US Fulbright Scholar grant, conducted the discussions and interviews, coded the transcripts and applied the themes to produce this manuscript. Precious Chidozie Azubuike Performed the recordings and transcriptions, and was involved in planning. He processed the qualitative data, participated in the analysis, contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

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CONFLICT OF INTEREST

There is no conflict of interest in this study.

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