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ENSURING SAFE MOTHERHOOD IN CONFLICT: EVALUATING MATERNAL HEALTH INTERVENTIONS DURING THE BOKO HARAM CRISIS IN BORNO STATE, NIGERIA

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ABSTRACT: Pregnant women are disproportionately affected during insurgencies, experiencing restricted access to maternal healthcare. This study examined how Boko Haram Insurgency (BHI) constrained maternal healthcare utilisation and how women adapted to challenges in accessing services in Borno State, Nigeria. Data collection involved administering questionnaires to women of childbearing age in Dikwa, Gwoza, and Magumeri, as well as conducting interviews with healthcare providers and community members. Pearson's correlation coefficient was used to evaluate the relationship between health facility damage and maternal service utilisation. The analysis revealed that most women were aged 32-49 years (30.6%), had 5-6 children (37.3%), lacked formal education (36.7%), and were unemployed (60.7%). The insurgency impeded access to maternal healthcare, with one-third of respondents not receiving adequate antenatal care due to poor roads, distance, lack of spousal permission, and fear of being attacked. Skilled deliveries at birth decreased to less than half. Non-governmental organisations were the primary providers of maternal healthcare in the affected areas, offering antenatal, postnatal, and delivery services. In conclusion, maternal healthcare utilisation was constrained, and essential services, such as caesarean sections, were inaccessible due to limited medical equipment. This study recommends funding rural healthcare facilities, training providers, implementing maternal healthcare services, including antenatal, emergency obstetric, and postnatal care, and enhancing community outreach programs to reduce maternal mortality in rural regions.

Keywords: Boko Haram, Healthcare, Insurgency, Maternal Health, Mortality, Utilisation

INTRODUCTION

Women and children are disproportionately affected by armed conflict and insurgency; however, maternal mortality remains a significant challenge. Despite numerous government efforts to reduce

maternal deaths, the rates remain high. Factors contributing to maternal mortality include cultural beliefs (Shanto et al., 2023), cost (Istifa et al., 2021), distance (Paul & Chouhan, 2020), education (Paul & Chouhan, 2019), age (Istifa et al., 2021), and accessibility (Iacoella & Tirivayi, 2019) of healthcare services. Recent literature highlights a surge in inadequate maternal healthcare utilisation due to armed conflict and insurgencies (Tyndall et al., 2020; Ojeleke et al., 2022; Zhang et al., 2023). Studies in Afghanistan (Mirzazada et al., 2020), Burundi (Chi et al., 2015), Colombia (Ramos et al., 2020), Nigeria (Chukwuma & Ekhator-Mobayode, 2019; Tyndall et al., 2020), Nepal (Price & Bohara, 2013), and Pakistan (Das et al., 2020) consistently reveal significant negative correlations between armed conflict and the use of maternal and child health (MCH) services, including antenatal care (ANC), institutional deliveries, and caesarean sections.

Since 2009, the Boko Haram conflict has worsened the already low coverage of health services, triggering a severe humanitarian crisis (Tyndall et al., 2023). The rise of the Boko Haram insurgency (BHI) has disrupted the use of various social amenities, particularly healthcare services, including maternal healthcare (Chukwuma & Ekhator-Mobayode, 2019). Insurgents have attacked numerous government buildings, including healthcare facilities, leaving many in affected areas either partially destroyed or completely damaged, which profoundly impacts the utilisation of maternal health care services. According to the 2008 Nigeria Demographic and Health Survey, in Borno State, 58.6% of women aged 15-49 received antenatal care from a skilled provider during their last pregnancy. However, only 44.6% attended the recommended four or more antenatal care visits. Additionally, 38.4% of births were attended by skilled health personnel, 35.5% of deliveries occurred in health facilities, and 42.6% of women received postnatal care within two days of delivery (NDHS, 2008). These statistics highlight that maternal healthcare utilisation was a significant concern in Borno State even before the insurgency, with many women lacking access to essential care during pregnancy, childbirth, and the postpartum period. The insurgency likely exacerbated these challenges. Pregnancy-related fatalities remain a substantial contributor to maternal mortality in Borno State, further aggravated by the ongoing BHI crisis. The maternal mortality rate in Borno State was 1630/100,000 live births in 2018 (NDHS, 2018; Usman et al., 2018). According to Adamu et al. (2018), the rising maternal mortality rate in the state reflects the BHI's impact on healthcare delivery.

In Borno, a large number of healthcare facilities are out of reach, with 80% of the region classified as "high risk", which greatly hinders the ability of government bodies, UN agencies and NGOs to provide the necessary goods and services (Tyndall et al., 2020). Many regions face inadequate access to food, water, protective shelters, and healthcare. Pregnant women in most local government areas affected by the insurgency lack access to antenatal care, and many give birth in overcrowded IDP camps without postnatal care. Even when services are available, the quality of care is inconsistent due to insufficient monitoring and supervision by qualified technical personnel (FACT SHEET, 2019). Furthermore, as of 2019, the Humanitarian Response Strategy estimated that over 820,000 people still reside in hard-to-reach areas where communities receive little or no healthcare services (Health Sector Bulletin, 2019a). With the support of partners, mobile health teams have become a rapid source of service delivery in hard-to-reach areas, new displacement locations, and areas lacking functional health facilities (Health Sector Bulletin, 2019b). Several studies have documented the impact of the BHI on maternal healthcare utilisation (Chukwuma & Ekhator-Mobayode, 2019; Tyndall et al., 2020; Ojeleke et al., 2022). However, all studies used

secondary data, and Tyndall et al. (2020) selected Abuja and Yola (in Adamawa State) as their study areas. Therefore, this study investigates the extent to which the Boko Haram insurgency has constrained maternal healthcare utilisation in selected LGAs of Borno State, and how women adapt to these constraints.

MATERIALS AND METHODS

Design and settings

A cross-sectional research design was employed to collect data from women of reproductive age (15-49 years) from Borno State (Dikwa, Gwoza, and Magumeri). One Local Government Area (LGA) was selected from each senatorial district. The LGAs were selected for their relative peace at the time of the data collection. The strata were women of childbearing age who used maternal healthcare during the insurgency period. The Dikwa Local Government Area (LGA) is situated in eastern Borno State and has ten wards. The LGA was once controlled by non-state armed groups (NSAGs) but was recaptured by the Nigerian army in 2015 (Fact Sheet, Dikwa, 2019). The LGA capital, Dikwa Town, is located 90 km from the state capital, Maiduguri, and serves as a gateway to many other LGAs, including Bama, Ngala, Mafa, and Marte (Fact Sheet Dikwa, 2019). As reported by Last Mile Delivery (n.d.), there have been incidents involving the abduction of women and girls, destruction of towns, killing of hundreds of innocent civilians, and large-scale displacement (OCHA Fact Sheet Dikwa, 2019; Last Mile Delivery, n.d.). Huge assets were looted, and livelihoods were devastated. Dikwa has one hospital, one primary healthcare facility, and five mobile clinics (Fact Sheet Dikwa, 2019). Non-governmental organizations established three new health outposts at Masarmari, Kamchiji, and Alhaji Bashir Internally Displaced Persons (IDP) camps to enhance the provision of health services. They also deliver routine, free primary healthcare services to IDPs in both camps and the host community, including outpatient departments (OPDs), reproductive health/maternity services, pharmaceuticals, laboratory services, inpatient care, and immunisation (Fact Sheet Dikwa, 2019). Secondary health services are lacking due to the closure of government healthcare facilities resulting from insecurity (OCHA Fact Sheet, Dikwa, 2019). FHI360 continues to deliver high-quality primary health services in Dikwa.

The Gwoza Local Government Area (LGA) is located in southern Borno State. Gwoza Town is situated approximately 135 km southeast of Maiduguri, the capital of Borno State. From 2014 to 2015, Gwoza served as the headquarters of Boko Haram (Fact Sheet Gwoza, 2020). The LGA has experienced significant violence, including the killing of hundreds of civilians, abduction of women and girls, destruction of towns, and large-scale displacement of populations (Fact Sheet, 2020). Following the recapture of Gwoza Town by the Nigerian Armed Forces in March 2015, the population gradually returned to the town (OCHA, 2019; Fact Sheet Gwoza, 2020). However, the reestablishment of civilian government authorities in Gwoza Town has been sluggish, adversely affecting the implementation of humanitarian activities in the area (OCHA, 2019). The security situation outside Gwoza remains precarious, with heightened concerns regarding IDP protection. Freedom of movement is restricted owing to curfews and a six-kilometre security perimeter surrounding the camp. Gwoza hosts three formal internally displaced persons (IDP) camps: GSS, 20 Housing, and Wukani, in addition to one informal IDP camp (Dangote), which is managed by the International Organisation for Migration (IOM) (UN Office for the Coordination of

Humanitarian Affairs). Humanitarian partners provide primary and secondary health services across IDP camps and host communities (OCHA, 2019; Fact Sheet Gwoza, 2020). Humanitarian partners manage one functional secondary health facility, two primary healthcare facilities, and three mobile clinics (OCHA, 2019).

The Magumeri Local Government Area (LGA), located in the northern region of Borno State, comprises 14 wards. Previously, under the control of non-state armed groups (NSAGs), the LGA was reclaimed by the Nigerian Army in 2015. The capital of the LGA, Magumeri Town, is located 45 km from the state capital, Maiduguri (Health Sector Bulletins, 2020). As reported by Last Mile Delivery (n.d.), the region has experienced the abduction of women and girls, destruction of towns, killing of hundreds of innocent civilians, and large-scale displacement (Health Sector Bulletin, 2019c). Livelihoods have been severely impacted, and assets have been looted. The security situation outside Magumeri remains precarious, with significant concerns regarding the protection of civilians (Health Sector Bulletin, 2020). In Magumeri, INTERSOS supports four health facilities, one General Hospital, two health posts in Titiwa and Kalizoram IDP Camps, and four mobile clinics (Health Sector Bulletin, 2019a; Health Sector Bulletin, 2020).

While purposive sampling introduces an element of bias, it yields rich and meaningful findings because the participants possess first-hand experience with the phenomenon under investigation. This approach enabled the study to gather in-depth insights into the challenges and coping mechanisms that women employed when accessing maternal healthcare services amid conflict. However, systematic sampling helps minimise bias in the selection process by ensuring that every nth participant is chosen from a sampling frame. This method enhanced the representativeness of the sample and bolstered the generalisability of the findings.

Population

The target population for the study consisted of women of childbearing age (15-49 years) who gave birth during the insurgency (2016-2019). According to the 2019 projected population data from the National Population Commission (NPC) and the National Bureau of Statistics (NBS), the population of the Magumeri LGA was 197,100, of which 50,325 were women of childbearing age (14-49 years) (NPC & NBC, 2019). In the Gwoza LGA, the population was 388,600, comprising 95,140 women of childbearing age (14-49 years) (NPC Projected Population, 2019). The population of the Dikwa LGA was 147,600, of which 35,250 were women of childbearing age (14-49 years) (NPC & NBC, 2019). Therefore, the total number of women of childbearing age in the three LGAs stands at one hundred and eighty thousand seven hundred and fifteen (180 715), which was used to draw the sample for this study.

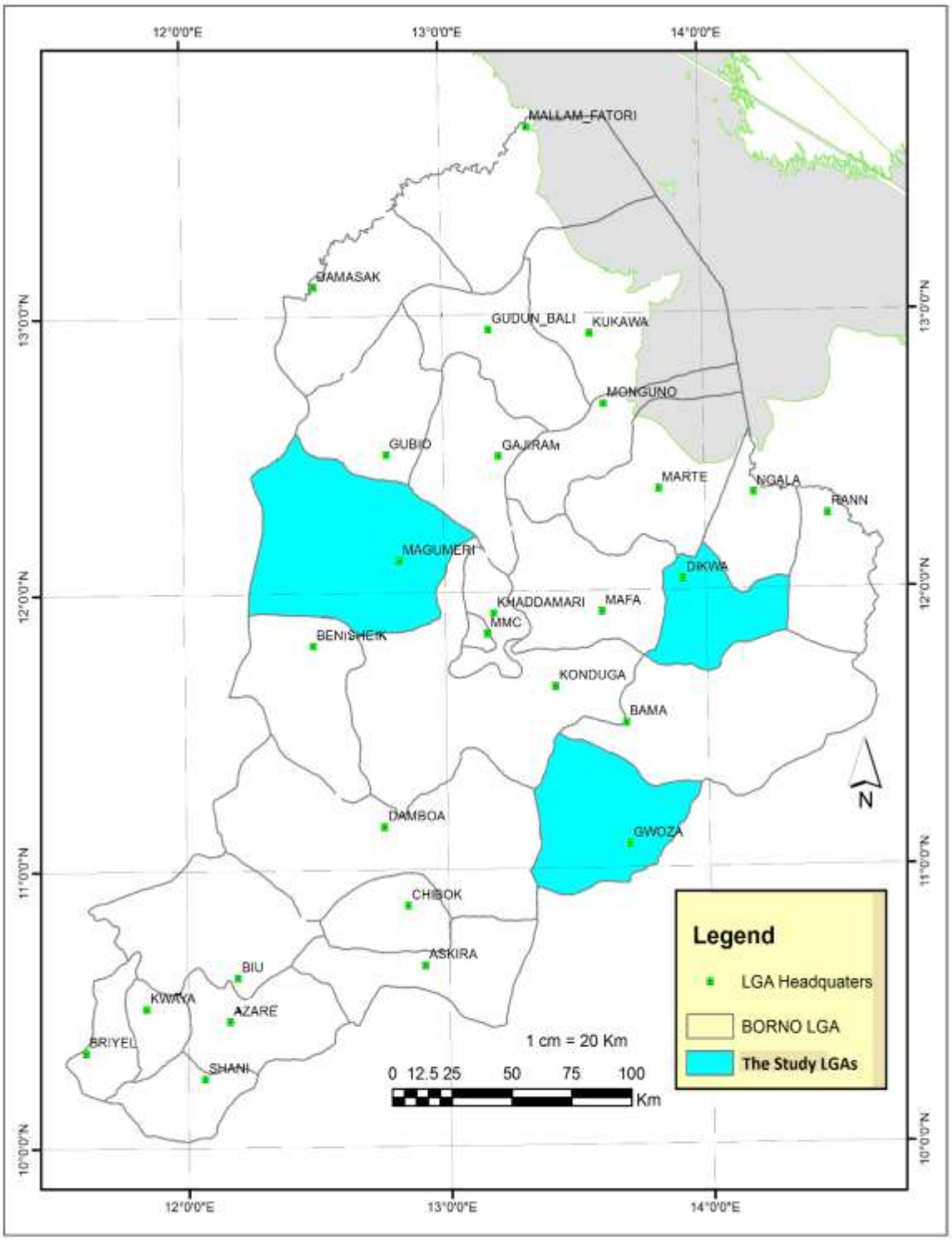

Fig. 1 Map of Borno State showing the study area (s). Sources: GEONETCast, Department of Geography (2019)

Data collection

A self-structured questionnaire was distributed to women of childbearing age who attended health facilities and those living in camps in the study area. Participants who could not read were interpreted in local languages by research assistants. Women were asked about their wards before the questionnaires were distributed. The questionnaire was not distributed in Gwoza health facilities because healthcare providers said that it was not allowed. Although all people from the surrounding villages and wards relocated to the local government headquarters, the women were asked to identify the wards from which they came to ensure that the target population was maintained. In-depth interviews were also conducted with security personnel, community leaders, non-governmental organisation (NGOs) personnel, husbands, and an elderly woman in each LGA. All interviews were conducted in English, Kanuri, and Hausa and recorded with the consent of the interviewees. All recordings were deleted after transcription as part of the ethical considerations. Prior to distributing the questionnaire, a pilot study was conducted to assess the validity of the questions.

Table 1: The Projected Population of the Study Areas (2019)

LGA	2006 Population	2019 Estimate	No. of women 14-49 years	Percent
Dikwa	105,042	147,600	35,250	19.5
Gwoza	276,568	388,600	95,140	52.6
Magumeri	140,257	197,100	50,325	27.8
Total			180,715	100

Source: National Population Commission of Nigeria and National Bureau of Statistics (2019)

The sample population for this study was one hundred and eighty thousand seven hundred and fifteen (180,715) respondents (women of childbearing age 14-49 years). These numbers were drawn from the total number of women of childbearing age in the three local LGAs. Yamane's (1967) method was used to determine the sample size for this study as follows:

$$n = \frac{N}{(1+N\ (0.05\ \ ^2)} \text{ (Yamane, 1967)}$$

$$n = \frac{180{,}715}{(1+180{,}715\ (0.05\ \ ^2)}$$

$$n = \frac{180{,}715}{180{,}715\ (0.05\ \ ^2)}$$

$$n = \frac{180{,}715}{180{,}715\times\ 0.0025}$$

$$n = \frac{180{,}715}{451.7875}$$

$$n = 400$$

The sample size was based on the population of each LGA. Dikwa local government had 76 (19%), Gwoza 212 (53%), and Magumeri 112 (28%) respondents, respectively. However, 363 of the 400 questionnaires were retrieved.

Table 2: Determining sample size

LGA	Women 14-49 years	Percent	Sample size
Dikwa	35,250	19.5	76
Gwoza	95,140	52.6	212
Magumeri	50,325	27.8	112
Total	180715	100	400

Source: Field Survey (2019)

The sampling method used in this study employed multiple sampling stages. In the first stage, Dikwa, Gwoza, and Magumeri were purposively selected from the three senatorial districts because of their high number of attacks and accessibility issues. Five wards were selected from the three LGAs using a systematic technique in the second stage of the study. These wards were arranged alphabetically and systematically selected using n-1, n-3, n-5, n-8, and n-10 for Dikwa, and n-1, n-4, n-7, n-10, and n-13 for Magumeri and Gwoza LGAs (Table 3). The respondents were selected based on the percentage of respondents in each LGA (Tables 1 and 2).

Table 3: Wards selected in each Local Government

Dikwa LGA	Frequency	Gwoza LGA	Frequency	Magumeri LGA	Frequency
Bososhe	12	Ashigashiya	41	Ardo ram	19
Gajibo	16	Dure/Wala/Warabe	37		
Mallam maja	17	Gwoza Town Gadamayo	40	Furram	21
Ngudoram	15	Johode/ Chikide/ Kughum, Kirawa/ Jiminy	38	Gowa	19
Ufaye/Gujile	13	Pulka/ Bokko	40	Kareram	18
				Ngamma	17
73			**196**		**94**

Source: Field Survey (2019)

In the third stage, women of childbearing age (14-49 years) were selected using a purposive sampling technique. These women were selected from both the camps and host communities, as well as from camp clinics. In the Gwoza local government, data were not collected from health facilities because healthcare providers stated that they were not permitted to conduct interviews or distribute questionnaires. Therefore, the questionnaires were distributed only at the camps in the study. In the fourth stage, nine respondents were purposively selected for in-depth interviews (Table 8). Husbands, elderly women, health care providers, non-governmental organisation personnel, and TBA providers. These respondents were selected based on their social position and

knowledge of maternal health. Elderly women with motherhood experience, who have now reached menopause, were purposively selected because they had information (knowledge) on how maternal healthcare was utilised before the emergence of the BHI

Data analysis

Data were analysed using descriptive statistics for quantitative data, with tables used to display frequencies and percentages. Pearson's correlation coefficient was used to assess the relationship between the extent of damage to healthcare facilities and the utilisation of maternal healthcare services. For qualitative data, all interviews were transcribed, and the verbatim transcripts were analysed in accordance with established procedures for inductive, qualitative, and thematic analyses. In accordance with the accepted ethical standards, all audio recordings were deleted upon completion of the transcription process.

Ethical approval

Ethical approval for this study was obtained from the Department of Sociology at the University of Maiduguri. This study adhered to the ethical standards of social-science research. The researcher sought permission from the participants and promised that their anonymity and confidentiality would be maintained unless they voluntarily and explicitly waived it. We took several measures to ensure that the participants felt safe and comfortable providing their consent. We provided clear and simple information about the study's purpose and risks in local languages, ensured confidentiality and anonymity, and emphasised the participants' rights, including the right to refuse or withdraw. Given the conflict-affected context, we worked closely with local partners and community leaders to facilitate access and build trust

RESULTS

Table 5 presents the results of Pearson's correlation analysis, indicating that BHI activity significantly impacted maternal healthcare utilisation. Table 6 details the demographic characteristics of the respondents, revealing that nearly half of the participants were aged between 32 and 49 years and were also widowed. Table 7 illustrates maternal healthcare utilisation during the insurgency, showing a reduction in the use of antenatal care and skilled delivery at birth due to fear of attacks. Additionally, most health facilities are not operational due to a shortage of healthcare providers.

Pearson Correlation Coefficient

The Pearson correlation coefficient (r) between "Damage" and "Utilisation" was -0.858, indicating a strong negative linear relationship between these two variables. As "Damage" increases, "Utilisation" tends to decrease. The two-tailed significance level (p-value) was 0.029, below the typical 0.05 level; therefore, the correlation was statistically significant and was unlikely to be due to chance. The high absolute correlation value (-0.858) indicates a strong relationship, as coefficients between -0.7 and -1 or 0.7 and 1 are considered strong correlations. Despite 86 instances of healthcare facilities being easily accessible, there was a -56 difference in utilization.

We recognise that the limited number of paired variables (six data points) may constrain the statistical validity of Pearson's correlation analysis. Nevertheless, considering the exploratory nature of this study and the difficulties associated with data collection in a conflict-affected region, we contend that this analysis offers valuable insights into the potential relationships between variables. We interpret the results with caution and propose that future research with larger sample sizes is required to substantiate these findings.

Table 4: Correlation between damaged facilities and maternal health care utilisation

Damage and utilised medical facilities	Frequency	Differences between damages and utilisation
Healthcare facility destroyed	64	
Utilisation of healthcare facilities	18	-46
Ambulance destroyed	156	
Pregnant women attend healthcare facilities	146	-10
Drugs and equipment destroyed	158	
Insurgents attack health facilities	123	-35
Healthcare providers killed	115	
Healthcare providers attend to pregnant women	62	-53
Healthcare providers injured	142	
Healthcare facilities are easily accessible	86	-56
Healthcare providers abducted	98	
Security personnel protect healthcare facilities	98	0

Source: Field Survey (2019)

Table 5: Correlation Table

		Damage	Utilisation
Damage	Pearson Correlation	1	-0.858*
	Sig. (2-tailed)		.029
	N	6	6
Utilisation	Pearson Correlation	-0.858*	1
	Sig. (2-tailed)	.029	
	N	6	6

Correlation is significant at the 0.05 level (2-tailed).

Pearson's correlation analysis examining the relationship between damaged healthcare facilities and their utilisation in regions affected by Boko Haram insurgents in Borno State revealed a

negative correlation (-0.858). This indicates that the damage inflicted by Boko Haram on healthcare facilities significantly impedes their proper and adequate utilisation in affected regions.

Table 6: Socio-Demographic Characteristics n=363

Variables	Frequency	Percentage	Variables	Frequency	Percentage
Age			**Marital status**		
14-19	65	17.9	Married	165	45.4
20-25	98	27.0	Divorced	76	20.9
26-31	89	24.5	Widowed	122	33.7
32-49	111	30.6			
Total	**363**	**100**	**Total**	**363**	**100**
Education			**Occupation**		
Non	133	36.7	Civil servant	33	9.20
Primary School cert	122	33.7	Self-employed	109	30.1
Secondary sch. cert	78	21.4	Not employed	193	60.7
Diploma and above	30	8.20			
Total	**363**	**100**	**Total**	**363**	**100**
Number of children					
1-2	63	17.3			
3-4	130	35.7			
5-6	135	37.3			
More than 7	35	9.70			
Total	**363**	**100**			

Source: Field Survey (2019)

Table 6 shows that most respondents (30.6%) were between 32 and 49 years, and the least (17.9%) were 14-19 years. In addition, most respondents (45.4%) were married, and one-third (33.7%) were widowed due to the ongoing insurgency. Those with no formal education (36.7%) constituted the largest percentage of responses; however, approximately 33.7% held primary school certificates. Most respondents (60.7%) were not employed, and approximately one-third (30.1%) were self-employed. Approximately 37.3% of the respondents had 5-6 children, and those with more than 7 (9.70%) were the least.

Table 7: Utilisation of MCH during the Insurgency n=363

Variables	Frequency	Percentage	Variables	Frequency	Percentage
Health care providers in the health facilities			**Accessibility**		
Available	190	52.3	Accessible	204	56.2
Not available	173	47.7	Not accessible	159	43.8
ANC visits			**Reasons for not attending ANC**		
Regular	96	26.4	Poor road network	28	24.3
Not regular	152	41.8	Permission not given by husband	56	48.7
Not at all	115	31.6	Fear of attack	31	27.0

Skilled delivery			**Reason for unskilled delivery**		
Received	254	69.98	No health centre	85	23.4
Not received	109	30.02	Distance is far	67	18.4
			Not operating at night	211	58.2
Availability of health care providers			**Attending health facilities**		
Available	190	52.3	With fear	213	58.7
Not available	173	47.7	Without fear	150	41.3
Maternal health provided by NGOs			**Maternal health provided by TBAs**		
Received	296	81.6	Received	254	69.98
Not received	67	17.9	Not received	109	30.02
Total	**363**	**100**	**Total**	**363**	**100**

Source: Field Survey (2019)

Table 7 shows that healthcare providers were available (52.3%), accessible (56.2%), regular antenatal visits were conducted (26.4%), and skilled deliveries were provided (69.98%). However, those who did not visit the health facilities for ANC said that poor road networks (24.3%), no permission from husbands (48.7%), and fear of attack (27%) were the reasons for non-attendance. In addition, those who did not receive skilled delivery assistance reported that there was no health facility close to them (23.4%), the distance to the health centre was far (18.4%), and it was not operating at night (58.2%). Generally, NGOs provided maternal healthcare (81.6%) to most respondents in places where the insurgents' activities are severe and in other places where respondents fear attack, TBAs (69.98%) provided maternal healthcare.

Table 8: In-depth interview n=9

Rank/level	**Frequency**
Healthcare provider	2
Husband	3
Elderly woman	2
NGO personnel	1
TBA provider	1
Total	9

Source: Field Survey (2019)

The in-depth interviews shed more light on the reasons for not utilising the health facilities, as most respondents agreed that fear of attacks was the main reason for non-utilisation. However, this study also found that maternal healthcare was provided free of charge by NGOs, but prior to the BHI, they had to pay a certain amount. In addition to fear of attacks, antenatal visits are not regular even before the emergence of BHI, especially in Magumeri (in-depth interview).

In-depth interviews revealed the following:

> *According to one of the elderly women whose age was around 69, interviewed at Magumeri said: Before the insurgency, women attended the antenatal clinic at least two to three times during pregnancy; however, due to the insurgency, women were reluctant to attend,*

> *and the reason most husbands did not allow their wives to attend was the fear of being attacked* (elderly woman, 69 years from Magumeri).

One of the respondents, who was a husband of approximately 62 years old from Dikwa, said the following:

> *Because of the ongoing insurgency, we do not allow them to attend healthcare facilities to prevent themselves from attacks, as they frequently attack health facilities (husband,* 62 years from Dikwa).

In-depth interviews also revealed that pregnant women are afraid of being attacked.

> *According to one of the husbands interviewed at Gwoza: We are all afraid of attacks from insurgents as well as our women* (husband from Gwoza).

In-depth interviews revealed that non-governmental organisations provided most of the community's maternal healthcare services. The non-governmental personnel interviewed (a female community health worker) at Gwoza provided healthcare to all community members. When asked whether they had used governmental health facilities, she said that they had no separate health facilities for them. According to her:

> *We provide maternal health care, such as antenatal care and skilled delivery at birth, to pregnant women, and many pregnant women visit us regularly. In addition, we have mobile clinics that provide healthcare services to hard-to-reach areas in all affected areas of the state, which are provided by international organisations (community health workers from the NGO Gwoza)*.

The in-depth interviews revealed that even before the emergence of the insurgency, traditional birth attendants conducted deliveries in the community. A husband of approximately 57 years, interviewed at Magumeri, said the following.

> *Patronising traditional birth attendants is safer than utilising health care facilities because the health care facility is always their target, including other government buildings (husband, 57 years from Magumeri*).

An elderly woman aged about 69 years interviewed at Dikwa said:

> *A woman can give birth at home; however, if there is any problem, we seek assistance from healthcare providers. In some cases, women may die from bleeding or other problems. However, we did not observe many deaths (an elderly woman, 69 years of age from Dikwa).*

A woman aged about 52 years (TBA) interviewed at Magumeri said:

> *I visit many families to conduct deliveries and sometimes check their health status. This practice has been ongoing even before the emergence of BHI. However, with the ongoing*

> *insurgency, most families utilise us because of fear of attacks and sometimes due to restrictions on movement. We were trained by health officials from the government and NGOs (TBA from Magumeri).*

A healthcare provider interviewed at Gwoza said:

> *We provide maternal healthcare service together with NGO personnel under tense conditions as we do not know when the next attack will come (healthcare provider, Gwoza).*

A healthcare provider interviewed at Magumeri said:

> *We are all afraid to provide services and the only functional health facility was destroyed by the insurgents. Most of my colleagues have relocated to safer locations. NGOs and TBAs provided most services. NGOs deliver free primary healthcare services in camps and in the host community, and sometimes use a helicopter in hard-to-reach areas (healthcare provider,* Magumeri*).*

DISCUSSION

This study assessed how women utilise maternal healthcare facilities in areas affected by insurgency. This is the first study to use primary data to investigate how women use maternal healthcare in areas affected by the BHI in Borno. The study revealed that the utilisation of antenatal care and skilled delivery at birth has been reduced because of the fear of attack. One-third of respondents lacked adequate antenatal care, citing poor roads, distance, spousal restrictions, and fear of attacks. This study corroborates the findings of Mirzazada et al. (2020), who determined that armed conflict adversely affects the utilisation of maternal and child health (MCH) services, including antenatal care (ANC), institutional delivery, and caesarean sections. However, previous studies have indicated poor maternal healthcare utilisation in these communities (NDHS, 2008, Usman et al., 2008) with factors such as ignorance, cultural beliefs, and inadequate facilities impeding them.

The study further revealed that inadequate health facilities, distance, and fear of attacks were reasons for unskilled deliveries. During the critical periods of the insurgency, it was challenging to reach health facilities because of the fear of being attacked. However, mobile clinics have also provided care in hard-to-reach areas. Although the ongoing insurgency hinders the utilisation of maternal healthcare, NGOs provide these services (Altare & Malembaka, 2020; Singh et al., 2021).

In addition, the respondents said that they only received maternal healthcare during the day because the health facilities did not operate at night due to attacks from Boko Haram insurgents. This finding is consistent with a similar study in conflict settings, which reported that accessing services is challenging and that they are not delivered systematically or comprehensively (Gaffey et al., 2021; Singh et al., 2021). In Iraq, armed conflict has negatively affected maternal healthcare services (Chi et al., 2015; Nguyen & Le, 2022). This study found that in Dikwa, even before the conflict, there was no functional health facility, which was also reported by REACH (2019). Similar findings were reported in Burundi and Northern Uganda (Chi et al., 2015).

Most respondents agreed that healthcare facilities were accessible and available. However, despite their availability, most women fail to attend because they fear being attacked by insurgents. The findings of this study reveal a paradoxical situation in which healthcare facilities are available and accessible, yet women are reluctant to utilise them because of the fear of insurgent attacks. This highlights the complex nature of healthcare access in conflict-affected areas, where physical availability does not necessarily translate into utilisation. Fear of attack is a significant barrier to healthcare access, underscoring the need for innovative solutions to address this challenge.

However, despite the interruption in maternal healthcare provision by insurgency, most respondents agreed that non-governmental organisation personnel provide maternal healthcare services in most communities affected by insurgency. This study also highlights the critical role of non-governmental organisations (NGOs) in providing maternal healthcare services in conflict-affected areas. These findings corroborate existing research suggesting that international humanitarian organisations play a vital role in providing humanitarian assistance to conflict-affected populations (Li et al., 2019; Singh et al., 2021). However, it is essential to note that reliance on NGOs for healthcare provision raises questions about sustainability and the long-term impact on health systems. Likewise, in-depth interviews revealed that NGOs provide maternal healthcare (MHC), including skilled delivery, to most displaced women. In addition, previous studies have found that some indicators of MCH service utilisation are positively correlated with armed conflict (Namasivayam et al., 2017). Similar findings have been reported for Somalia and South Sudan (Ahmed et al., 2020; Sami et al., 2020).

In addition, personnel from non-governmental organisations provide most of the community's healthcare needs. Most respondents agreed that NGOs deliver free primary healthcare services in camps and the host community and sometimes use helicopters in hard-to-reach areas, which aligns with the Fact Sheet Dikwa (2019). MCH services are frequently provided without user fees and are fully sponsored by non-governmental groups in some conflict-affected areas, including the eastern Democratic Republic of Congo (DRC) (Maini et al., 2018). The Maternal and Child Health (MCH) clinic offers primary healthcare services to both the host community and internally displaced persons (IDPs) in Dikwa (Fact Sheet Dikwa, 2019). The report further revealed that the services provided by NGOs outweigh those provided by the government.

The finding that traditional birth attendants (TBAs) provide care to the community highlights their critical role in healthcare, particularly in areas where formal healthcare services are limited. This is consistent with existing reports, such as Fact Sheet Dikwa (2019) and Health Sector Bulletin (2019c), which note that many women in both formal camps and host communities give birth at home with the assistance of traditional TBAs. However, this reliance on TBAs raises concerns about the quality and safety of care, particularly in cases where complications may arise during delivery. Emergency obstetric care in areas affected by insurgency is limited, and not all services required by pregnant women can be assessed. For example, a caesarean section surgery performed on a pregnant woman with complications during delivery cannot be performed because of limited health equipment.

Furthermore, the limited availability of comprehensive secondary care in most Local Government Areas (LGAs) in Borno, including Dikwa and Magumeri, poses a significant challenge to maternal

healthcare. The lack of essential health equipment and services, such as caesarean section surgery, can have devastating consequences for pregnant women with complications such as preeclampsia. While some non-governmental organisations have made efforts to provide functional secondary facilities in certain areas, such as Gwoza, the overall picture is one of inadequate access to essential healthcare services.

The referral system, which requires pregnant women with complications to be referred to Maiduguri, is also fraught with challenges. Delays in accessing care can have severe consequences for the health of both mothers and babies. This highlights the need for more comprehensive and accessible healthcare services, including secondary care, in conflict-affected regions.

The Three Delays Model was used to elucidate the challenges of healthcare access in insurgency-affected areas and examine the impact of insurgency on maternal healthcare utilisation. The Three Delays Model (Thaddeus & Maine, 1994) delineates barriers to maternal healthcare access through three distinct phases: delays in seeking, reaching, and receiving care, respectively. In regions impacted by BHI, these delays are intensified by the destruction of healthcare infrastructure and restricted access, a situation reported in numerous conflict-affected areas in Nigeria (Abdullahi et al., 2017). Women may defer seeking care due to fear of violence, and damaged roads and facilities further impede access. Insurgents, including the BHI and others in regions such as South Sudan, have been reported to destroy health facilities (Sami et al., 2020). Those who manage to reach healthcare facilities frequently encounter delays due to shortages of healthcare providers, equipment, and other supplies. The overwhelming workload and limited resources faced by most healthcare providers contribute to these delays in care.

Conclusion

The primary finding of this study is that insurgency has substantially hindered the effective delivery of maternal healthcare services, leading to a deterioration in the quality of these services. Since November 2019, accessing healthcare services has presented a significant challenge in numerous regions, particularly in Borno State, where health sector partners have relied on UNHAS helicopters to reach communities in need. Although disruptions in service delivery were observed, the study was unable to conclusively determine the maternal mortality rates, which did not appear to have increased significantly in the surveyed population. Nonetheless, this study emphasises the urgent need for continued support of maternal healthcare services in conflict-affected areas. The study also revealed that pregnant women received free maternal healthcare, a change from the situation before the insurgency. The study found that non-governmental organisations are the primary providers of services to pregnant women. These findings highlight the importance of safeguarding healthcare facilities and providers to ensure the uninterrupted delivery of healthcare services. This study recommends securing funding for rural healthcare facilities, training and deploying skilled healthcare providers, implementing comprehensive maternal healthcare services—including antenatal care, skilled birth attendance, emergency obstetric care, and postnatal care—and enhancing community engagement and outreach programs. By adopting these measures, policymakers can ensure the smooth delivery of maternal healthcare in areas affected by insurgency.

Limitations

The findings of this study may not be entirely representative of all health facilities in the region, as one facility was not included in the study. This non-participation may limit the generalisability of the results to other facilities. The absence of this facility could introduce bias, particularly if it has unique characteristics that differ from those of the participating facilities. The study's conclusions are derived from data collected from two facilities, which may not encompass the full spectrum of experiences and perspectives of women in the region. The interpretation of Pearson's correlation results was approached with caution because of the small sample size and potential limitations in statistical validity. These findings should be considered preliminary, and further research with a larger sample size is necessary to confirm the results, or alternative statistical methods that are more suitable for small sample sizes should be employed.

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