# Knowledge, perception, and attitude of health-care professionals toward obstetrics ultrasonography in selected internally displaced persons' camps in North-east Nigeria

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**Abstract Background:** Ultrasound is the frontline diagnostic tool of choice for perinatal care. It is usually provided in ideal settings by experts.

**Objectives:** The objective of this study is to determine the knowledge, perception, and attitude of health-care professionals toward obstetric ultrasound in internally displaced persons (IDPs) camps in Maiduguri, Borno state, North-east Nigeria.

**Materials and Methods:** A prospective survey was conducted in three selected IDPs camps in Maiduguri from January to May 2017. Healthcare personnel from the antenatal clinics of the selected IDPs camps were enrolled in the study. A 26-item structured questionnaire was used to elicit responses on demography, knowledge, perception, and attitude. Data collected were analyzed using the Statistical Package for Social Sciences version 21 and descriptive statistics were generated for the data.

**Results:** Out of the fifty questionnaires distributed, forty-five were filled and returned appropriately; given a returned rate of 90.0%. The respondents consisted of community health extension worker (37.8%, n = 17), nurses (24.4%, n = 11), midwives (24.4%, n = 11), and doctors (13.3%, n = 6). Respondents had average knowledge about obstetric ultrasound (59%); however, their levels of perception and attitude toward obstetric ultrasound were high, 84% and 69%, respectively. Nevertheless, 31.1% of the respondents believed ultrasound to be harmful to the baby, 3.8% believed it can lead to cancer or can be painful, and 2.2% felt that there is no need for ultrasound scan during pregnancy. Doctors had the highest level of knowledge, right perception, and positive attitude toward obstetric ultrasound (100%).

**Conclusion:** A good number of the respondents had the right perception and attitude toward obstetric ultrasound, but generally most respondents had inadequate knowledge.

Keywords: Internally displaced persons, knowledge, obstetric ultrasound, perception and attitude

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# **INTRODUCTION**

More than half of the world's population does not have access to radiologic services.<sup>[1]</sup> In industrialized countries, ultrasound has become a routine diagnostic tool, while developing countries are lagging behind. Ultrasound has been recommended for developing countries by the World Health Organization because it provides immediate images, relatively inexpensive, can be carried out on an outpatient basis and has no known side effects.<sup>[2]</sup> In much of sub-Saharan Africa, imaging in patient care is limited to urban settings and lack of adequate healthcare facilities, personnel and diagnostic tools remain a major barrier to healthcare delivery in low-resource settings such as camps of internally displaced persons (IDPs).<sup>[3]</sup> The efforts of nongovernmental organizations have continued to strengthen and scale up existing public sector healthcare models in such low-resource settings.<sup>[4]</sup>

Ultrasound is a safe and valuable tool in all trimesters of pregnancy. In the first trimester, ectopic pregnancy is a leading cause of mortality in women in low or medium income societies, requiring early identification and prompt intervention.<sup>[4]</sup> Since clinical signs and symptoms are not reliable, ultrasound plays a pivotal role in its diagnosis.<sup>[4]</sup> Furthermore, ultrasound plays an important role in surveillance and management of high-risk pregnancies leading to improvements in pregnancy outcomes.<sup>[1,4]</sup>

Internally displaced people are persons or groups of persons who have been forced to flee or leave their homes, and who have not crossed an internationally recognized state border.<sup>[5]</sup> It is generally accepted that in rural and remote areas of low- and middle-income countries, diagnostic imaging is often insufficient and in some instances completely lacking.<sup>[6]</sup> Thus, the major objective of healthcare services for IDPs is to reduce mortality and morbidity among them through interventions that target the most vulnerable (women, children, and disabled) in these communities.<sup>[7]</sup>

Knowledge of the medical indications for ultrasonography in pregnancy and how to effectively communicate it to patients are competencies required of physicians and healthcare providers.<sup>[8]</sup> Furthermore, as portability and durability improve, bedside ultrasound is experiencing increased use in rural underdeveloped parts of the world, and a growing body of literature supports the use of point of care ultrasound.<sup>[1,9]</sup> Point-of-care ultrasound simply means the application of ultrasound as a bedside examination, during ward rounds, in emergency setups as in casualty departments within hospitals or in intensive care units. It also implies the use of ultrasound examination outside the hospital setup in cases of disasters, wars, remote areas, outreach health services, and in ambulances as patient is transported.<sup>[4,9]</sup> After >8 years of violence in Borno state, from July 2009 to date, there has been an unprecedented level of population displacement. As of 2015, Maiduguri, the capital of Borno state hosts an estimated 1,434,149 IDPs.<sup>[9]</sup> Around the world, conflict and forced displacement cause loss of lives and livelihoods, increase poverty and the risk of disease and disrupts healthcare services such as antenatal care.<sup>[9,10]</sup> Therefore, antenatal care delivery to pregnant displaced women is critical to preventing maternal and fetal mortality.

The WHO new guidelines (2016) on antenatal care outline what care a pregnant women should receive at each of the contacts with the Health-care provider including fetal measurements with the use of ultrasound among others.<sup>[11]</sup> The recommendations also allow flexibility for countries to employ different options in delivering antenatal care based on specific needs.<sup>[2]</sup> Thus, care can be provided through midwives or other trained health personnel delivered at health facilities or through outreach services as in IDPs camps. Even though antenatal clinics have been operating in IDPs camps across the state, there is to date a paucity of studies exploring healthcare provider's knowledge, perception, and attitude toward obstetrics ultrasonography in IDPs camp settings.

# MATERIALS AND METHODS

# Study design

A descriptive cross-sectional survey through the use of questionnaire was undertaken to explore the level of knowledge of obstetric ultrasound among healthcare personnel in antenatal clinics at three major IDPs camps in Maiduguri; Dalori, Bakassi, and Teachers village and to further determine their perception and attitude to obstetrics ultrasound. Borno state is located in the northeastern part of Nigeria with a total area of 57,799 km<sup>2</sup> (22,316 sq mi) and population of 4,171,104. It has a total of 27 local government areas with Maiduguri as its capital Maiduguri. The state was formed in 1976 from the split of the North-eastern State. Until 1991, it contained what is now Yobe State. The state is dominated by the Kanuri people. Other smaller ethnic groups such as Lamang, Babur/Bura, and Marghi are also found in the southern part of the state. Borno state has been affected by humanitarian crises over the past 8 years. The National Emergency Management Agency reported that IDPs camps in Borno state are 32 in spite of recent return of some persons to liberated communities. Sixteen of the camps are in Maiduguri metropolis, whereas 16 others are in the local government areas, which are referred to as satellite camps. The number of persons in the 16 camps in Maiduguri fluctuates between 120,000 and 130,000, sometimes it is 120,000, and sometimes it is less depending on the situation.

Ethical clearance was obtained from the Health Research Ethics Committee of Borno state.

Recruitment of participants was done by convenience; only available antenatal staff present at the time of study was included in the study. All other staff of the IDPs clinics was excluded from the study.

A self-administered, structured hardcopy questionnaire comprising 26 items and divided into sections for demography, knowledge, perception, and attitude was used to collect data for the study. Pilot study was not carried out because the questionnaire was tested in previous studies and is found to be valid and reliable. Descriptive statistics comprising frequency and percentages were generated based on the responses of participants to the questionnaire and analysis was carried out using the Statistical Package for Social Sciences software version 21.0 (IBM, New York, USA). Cross-tabulation of attitude score and demographic data of the participants were also generated.

# RESULTS

# Demography

Out of the fifty questionnaires distributed, forty-five were filled and returned appropriately; given a returned rate of 90.0%. The respondents consist of 16 (35.6%) males and 29 (64.4%) females, aged between 18 and 42 years. Table 1 shows that the majority of the respondents (35.6%) were within the 28–32 years' age group, whereas the least number of respondents (6.7%) were within the 18–22 years' age group.

Table 1 also shows that most of the respondents (37.9%) were community health extension workers, 24.4% were nurses, 24.4% midwives, and only 13.3% were medical doctors. Predominantly, respondents had 1–5 years of practice experience; only about 11.1% have practiced for 11–15 years.

Table 2 shows that 84.4% of the respondents knew about obstetrics ultrasound. Majority of the respondents' source of information was through books (26.7%), workshops (24.2%), and school (22.2%). A total of 17.8% of the respondents knew about obstetrics ultrasound

## Table 1: Demographic profile of participants (n=45)

	Frequency (%)
Sex	
Male	16 (35.6)
Female	29 (64.4)
Age group (years)	
18-22	3 (6.7)
23-27	11 (24.4)
28-32	16 (35.6)
>32	15 (33.3)
Occupation	
Doctors	6 (13.3)
Midwives	11 (24.4)
Nurses	11 (24.4)
Community health workers	17 (37.9)
Years of practice	
1-5	24 (53.3)
6-10	10 (22.2)
11-15	5 (11.1)
>15	6 (13.3)

Table	2:	Know	ledge	of	obstetrics	ultrasound	( <i>n</i> =45)
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Variable	Frequency (%)
Do you know about obstetrics ultrasound scan?	
Yes	38 (84.4)
No	7 (15.6)
If yes, what was your source of information	
School	10 (22.2)
Media	8 (17.8)
Read about it	12 (26.7)
Friends/relations	4 (8.9)
Workshops/health talks	11 (24.4)
Is ultrasound scanning important during pregnancy?	
Yes	41 (91.1)
No	4 (8.9)
Is it important to have an ultrasound scan in the	
first trimester?	
Yes	28 (62.2)
No	17 (37.8)
How many times should an ultrasound scan be	
done in pregnancy?	
Once	8 (17.8)
Twice	22 (48.9)
Three times above	15 (33.3)
At what trimester is it essential to perform an	
anomaly scan?	
First	11 (24.4)
Second	19 (42.2)
Third	15 (33.3)
Ultrasound scan uses ionizing radiation	
Yes	28 (62.2)
No	17 (37.8)

through the media, and 8.9% got their information through friends and relatives.

Of the 45 respondents, 28 (62.2%) were of the opinion that ultrasound uses ionizing radiation. On the frequency of obstetrics scans, 33.3% of the respondents told three times, 49% told twice, and 17.8% told once. Majority of the respondents (42.3%) agreed that it is essential to perform anomaly scans in the second trimester, whereas 24.4% of the respondents were of the opinion that it should be done in the first trimester. In general, respondents had average knowledge (59%) about obstetrics ultrasound.

A cross-tabulation of knowledge score in the demographic classification of respondents shows a good level of knowledge among doctors (100%) [Table 3].

# Perception

Table 4 shows that 31.1% of the respondents agreed that ultrasound scan could be harmful to the baby, 26.7% agreed that it could cause cancer, 4.45% agreed that ultrasound scan could be painful, and 2.2% thought that there was no need for ultrasound scan during pregnancy.

Generally, the respondents had a good perception (84%) of obstetrics ultrasound as shown in Table 5.

# Attitude

Data collected showed that 93.3% of the respondents refer their patients for ultrasound scan. Reasons include assessment of gestational age (57.8%), fetal presentation (75.6%), fetal lie (80%), placenta localization (71.1%), determination of expected date of delivery, sex determination (48.9%), and to check for abnormalities (60%) as shown in Table 6. The respondents generally had a good attitude (69%).

Table 7 shows a cross-tabulation of attitude score and demographic data of the participants. About 100%

Table 3: Cross-tabulation	of knowledge score and
demographic data of the	participants (n=45)

Variable	Knowled	Total,	Р	
	Poor, <i>n</i> (%)	Good, <i>n</i> (%)	n (%)	
Sex				
Male	1 (2.2)	15 (33.3)	16 (35.6)	0.087
Female	8 (17.8)	21 (46.7)	29 (64.4)	
Occupation	u · · ·	u · · ·		
Doctors	0 (0.0)	6 (13.3)	6 (13.3)	0.305
Midwives	3ຶ (6.7)	8 (17.8)	11 (24.4)	
Nurses	1 (2.2)	10 (22.2)	11 (24.4)	
Community health workers	5 (11.1)	12 (26.7)	17 (37.8)	
Years of practice	a · · ·	u · · ·		
<6	3, (6.7)	21, (46.7)	24 (53.3)	0.43
6-10	3 (6.7)	7 (15.6)	10 (22.2)	
11-15	2 (4.4)	3 (6.7)	5 (11.1)	
>15	1 (2.2)	5 (11.1)	6 (13.3)	

Level of significance

Table 4: Perception of obstetric ultrasound among participants

of the doctors had a positive attitude while those with 6 years of working experience had the highest positive attitude (35.6%) to obstetric ultrasound.

# DISCUSSION

Obstetrics ultrasound has become an important part of antenatal care. For effective care delivery, however, the care givers must have good knowledge, correct perception, and right attitude.<sup>[11]</sup>

This study showed that 59% of the respondents had a good knowledge of obstetrics ultrasound. Although studies among pregnant women have shown that majority of expectant mothers are aware of obstetrics ultrasound (96.4% and 96.3%),<sup>[12,13]</sup> this is attributable to the fact that ultrasound is widely performed, their poor knowledge, however, is likely due to the fact that a good percentage of the respondents (77.8%) obtained their information outside of organized and detailed learning in school. Doctors had excellent knowledge (100%) about obstetrics ultrasound which could be explained by the scope of their training curriculum. Furthermore, respondents with fewer years of practice had a higher knowledge of obstetric ultrasound (46.7%) than those with longer years of experience as shown in Table 3. This may be due to increased access to resources on the Internet or otherwise by this younger more active age group.

Majority of the respondents (84%) had the correct perception of obstetrics ultrasound as shown in Tables 4 and 5. This may be as a result of the good knowledge they have about obstetrics ultrasound. An important finding from the study is that a small, but significant number of respondents (31.1%) believe that ultrasound can be harmful to the unborn baby, 26.7% believed that it can lead to cancer, 4.4% felt that it can be painful, and 2.2% felt that there was no need for ultrasound scan during pregnancy. This is similar to results obtained when studying the perception of pregnant women toward obstetric ultrasound where 31.3% felt that too many ultrasound is harmful to the baby and 3.8% felt that it could lead to cancer.<sup>[14]</sup> This proportion of respondents may be derivatives of those that had poor knowledge of obstetrics ultrasound.

Variable	Agree (%)	Strongly agree (%)	Disagree (%)	Strongly disagree (%)	
Ultrasound scan is harmful to the baby	10, (22.2)	4, (8.9)	29, (64.4)	2, (4.4)	
Ultrasound scan can lead to cancer	7 (15.6)	5 (11.1)	23 (51.1)	10 (22.2)	
Ultrasound scan can be painful	2 (4.4)	0 (0.0)	33 (73.3)	10 (22.2)	
There is no need for ultrasound scan during	0 (0.0)	1 (2.2)	31 (68.9)	13 (28.9)	
pregnancy for the women in the IDP camps			-		

Level of significance. IDP - Internally displaced person

 Table 5: Cross-tabulation of perception score and demographic

 data of the participants (n=45)

Variable	Percepti	ion group	Total,	Ρ
	Poor, <i>n</i> (%)	Good, <i>n</i> (%)	n (%)	
Sex				
Male	2, (4.4)	14, (31.1)	16 (35.6)	0.674
Female	5 (11.1)	24 (53.3)	29 (64.4)	
Occupation	u · · ·	u · · ·		
Doctors	0, (0.00)	6 (13.30)	6 (13.30)	0.476
Midwives	3 (6.70)	8 (17.80)	11 (24.40)	
Nurses	2 (4.40)	9ູ(20.00)	11 (24.40)	
Community health workers	2 (4.40)	15 (33.30)	17 (37.80)	
Years of practice	ŭ	ŭ		
<6	5 (11.1)	19, (42.2)	24 (53.3)	0.588
6-10	1 (2.2)	9 (20.0)	10 (22.2)	
11-15	1 (2.2)	4 (8.9)	5 (11.1)	
>15	0 (0.0)	6 (13.3)	6 (13.3)	

Level of significance

 Table 6: Participants' attitude toward obstetrics ultrasound

Variable	Frequency (%)
Do you send your patients for ultrasound scan?	
Yes	42 (93.3)
No	3 (6.7)
To assess gestational age	
Yes	26 (57.8)
No	19 (42.2)
To show presentation of the baby	
Yes	34 (75.6)
No	11 (24.4)
To determine lie of the baby	
Yes	36 (80.0)
No	9 (20.0)
To locate placenta position	
Yes	32 (71.1)
No	13 (28.9)
To know the date of delivery (EDD)	
Yes	25 (55.6)
No	20 (44.4)
To detect cord round the neck	
Yes	22 (48.9)
No	23 (51.1)
To know the sex of the baby	
Yes	20 (44.4)
No	25 (55.6)
To see abnormalities in the womb of the mother	
Yes	27 (60.0)
No	18 (40.0)

EDD - Expected date of delivery

In this study, 69% of the respondents had a positive attitude toward obstetrics ultrasound. Majority told they send their patients for ultrasound scan. Majority of their request were to determine the lie and presentation of the fetus, placenta localization, and fetal observation as shown in Tables 6 and 7. On the other hand, in a study conducted by Ikeako *et al.* in 2014<sup>[13]</sup> on the attitude of expectant mothers to the use of ultrasound in pregnancy in a tertiary institution in Southeast Nigeria showed that majority of expectant mothers request ultrasound for fetal observation and gender determination.<sup>[13]</sup> This reveals that the reasons of healthcare providers for obstetric

 Table 7: Cross-tabulation of the attitude score and demographic data of participants

Variable	Attitude	Total (%)	Р	
	Negative (%)	Positive (%)		
Sex				
Male	4 (8.9)	12 (26.7)	16 (35.6)	0.851
Female	8ູ(17.8)	21 (46.7)	29 (64.4)	
Occupation	u · · ·	<u>u</u> · · ·		
Doctors	0, (0.0)	6 (13.3)	6 (13.3)	0.288
Midwives	2 (4.4)	9 (20.0)	11 (24.4)	
Nurses	4 (8.9)	7 (15.6)	11 (24.4)	
Community health workers	6ູ(13.3)	11 (24.4)	17 (37.8)	
Years of practice	4	ŭ		
<6	8 (17.8)	16 (35.6)	24 (53.3)	0.436
6-10	2 (4.4)	8 (17.8)	10 (22.2)	
11-15	0 (0.0)	5 (11.1)	5 (11.1)	
>15	2 (4.4)	4 <sub>a</sub> (8.9)	6 (13.3)	

 $_{\rm a} {\rm Level}$  of significance

ultrasound may be different from that of expectant mothers.

## Limitations of the study

We could not conduct the research in all the IDPs camps. Some respondents did not consent to the research work.

# CONCLUSION

The study showed that a good proportion of the healthcare providers had incorrect information about obstetrics ultrasound. Therefore, there is a need to do more to deepen and broaden the knowledge base of these healthcare providers through workshops, seminars, or bulletins for a holistic antenatal care delivery.

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### **Conflicts of interest**

There are no conflicts of interest.

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