

USE OF ULTRASOUND AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE IN SAME SELECTED HEALTH FACILITIES IN JAMA'A LOCAL GOVERNMENT AREA OF KADUNA STATE

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ABSTRACT

This study was carried out to help find the use of ultrasound among pregnant women attending antenatal care in some selected health facilities in Jema'a Local Government Area of Kaduna State. A survey research design was used for the study. The population of the study consists of pregnant women attending antenatal care in some selected health facilities in Jema'a Local Government Area of Kaduna State with approximate population of over eight hundred (800) pregnant women. A sample size of three hundred (300) pregnant women was drawn from the population for the purpose of the study using simple random sampling technique. A self structured questionnaire of four (4) sections was used to elicit information from the respondents; the instrument was validated by the project supervisor and two experts in measurement and evaluation in Kaduna State College of Education, Gidanwaya. A pilot study was conducted to test reliability of the research instrument, a test and retest method was used using spearman rho correlation coefficient and correlation coefficient of 0.81 was obtained which makes the instrument very reliable. The administered instrument was analyzed using simple percentages. Findings from the study revealed that the factors that influencing the use of ultrasound among pregnant women attending antenatal care are determination of gestational age, fetal viability, screening for fetal anomalies, availability of support, determination of multiple pregnancies, improved access to information, quality of services, am aware of ultrasound services for pregnant women, improved Socio-economic status, education level of the couple, distance to the health facility and lack of awareness about its benefits. The types of ultrasound services available for pregnant women attending antenatal care in healthcare facilities in Jema'a Local Government Area of Kaduna State are growth scan or fetal wellbeing scan (24-42weeks), early pregnancy scan (8-11 weeks), and nuclear translucency scan (11- 14 weeks). The factors influencing the lack of use of ultrasound among pregnant women attending antenatal care are satisfaction with the services rendered, facilities available, economic status, systematic (organizational), and costs of the ultrasound services. The types of health services available for pregnant women attending antenatal care in Jema'a Local Government Area of Kaduna State are vital signs, pelvic examination, measurement of weight, examination of the ankle for swelling, test of diabetes, ultrasound scanning, urine tests and blood tests.

Key Words: Ultrasound, Pregnant women, Antenatal care and health facilities.

INTRODUCTION

One of the health services available for pregnant women necessary for safe delivery is ultrasound services. FIGO (2015) emphasized that ultrasound (also called sonography or ultrasonography) is a noninvasive imaging test. An ultrasound picture is called a sonogram.

Ultrasound uses high frequency sound waves to create real-time pictures or video of internal organs or other soft tissues such as blood vessels. In addition they emphasized that ultrasound enables health care providers to “see” details of soft tissues inside ones body without making an incision (cuts).

Again, Good and sound health, when discussing about pregnancy and child birth is of paramount importance and one of those services is ultrasound. Describing ultrasound, Scotland’s National Telehealth and Telecare Organization (NHS24, 2023) stated that ultrasound scan, sometimes called a sonogram, is a procedure that uses high frequency sound waves to create an image of part of the inside of the body. An ultrasound scan can be used to monitor an unborn baby, diagnose a condition, or guide a surgeon during certain procedures.

In line with this ultrasound is known to be of different types as pointed out by Health Direct (2022). Ultrasound are of ten (10) ten types which are: Abdominal Ultrasound, Obstetrics/Pregnancy Ultrasound, Female Pelvis Ultrasound, Breast Ultrasound, Renal Ultrasound, Transrectal Ultrasound, Doppler Ultrasound, Echocardiogram, 3D Ultrasound and 4D ultrasound. So, however, this work is based on obstetric ultrasound which is a routine scan to assess the growth and health of the baby. To buttress this Usman, Olorunkoba, Umar and Idris (2019) express that obstetric ultrasound has been one of the most important advances in antenatal care worldwide. Ultrasound is safe, non-ionizing modality. It is affordable, accessible, acceptable and scientifically sound. However, it raises social, ethical and economic dilemmas for both health workers and the recipients of its services. According to them, in Nigeria, its use is said to be on the rise. However, the utilization of ultrasound may be affected by women literacy level. Obstetric ultrasound imaging has a lot of benefits in screening and diagnosis (in this work literacy level of the respondent are considered).

In line with this Oche, Abubakar, Mansur, Aminu, Gana, Ango and Habibullah (2012) discovered that majority (96.4%) of the respondents had good knowledge of ultrasound and its uses with a mean knowledge score of 86.3 ± 17 . Main reason for having a scan was to check the state of the fetus (38%) a total of 28.3% of the respondents had previously been given false information from the scan results mostly about the expected date of delivery (EDD). Again Open Journal Clinical Diagnostics (2021) discovered that slightly more than a third (36%) of the women had recently delivered. In total Kisii (Rural Country) had a representation of 59% of the respondents. Half of the respondents were aged between 25 – 34 years, 55% of the women interviewed were housewives while 48% had secondary level of education. Only 21% of the women had undergone routine ultrasound screening before 24 weeks of gestation with the average distance travelled by majority (45%) of the respondents to access the pocus service being 3 – 5 km. the need to confirm a pregnancy gestation was the major (68.1%) motivator for seeking the service in the two pilot countries. Employment status, household income, education level, pregnancy gestation and distance to the facility had a statistical significance ($P < 0.05$) with ultrasound utilization. Highest education level, pregnancy gestation and distance to the nearest ultrasound screening facility were found to significantly predict the likelihood of utilizing the ultrasound services ($P < 0.05$). The initial training and continuous hands on coaching of midwives by TOTS contributed a lot to acquisition of the deserved basic obstetric ultrasound screening skills. Some of these factors are considered in this work.

Pregnancy is the term used to describe the period in which a fetus develops inside a woman's womb or uterus. Pregnancy usually last about 40 weeks, or just over 9months, measured from the last menstrual period to delivery. Health care providers refer to three segments of pregnancy, called trimesters (WHO, 2016). In line with this, James (2011) states that pregnancy usually occurs by sexual intercourse, but can also occur through assisted reproductive technology procedures. A pregnancy may end in a live birth, a miscarriage, an induced abortion, or a still birth. Child birth typically occurs around 40 weeks from the start of the last menstrual period (LMP) a span known as the gestational age. This is just over nine months, counting by fertilization age, the length is about 38 weeks. Pregnancy is "the presence of an implanted human embryo or fetus in the uterus," implantation occurs on average 8 – 9 days after fertilization. An embryo is the term for the developing offspring during the first seven weeks following implantation (i.e. ten weeks gestational age) after which the term fetus is used until birth. Signs and symptoms of early pregnancy may include; missed periods, tender breast, morning sickness (nausea and vomiting) hunger, implantation bleeding, and frequent urination. Pregnancy may be confirmed with a pregnancy test. Methods of birth control or, more accurately, contraception are used to avoid pregnancy.

Discussing on problems associated with pregnancy, Cleveland Clinic (CLC, 2022) pointed out that there are medical conditions that may affect one or the fetus's health during pregnancy. These include; ectopic pregnancy, miscarriage, Hyperemesis gravidarum, congenital disorders, preeclampsia, gestational diabetes, preterm labour, infection, vaginal bleeding, placenta previa, placenta accrete, low amniotic fluid, depression and anemia. These are considered in this work.

Describing Antenatal Care, otherwise known as Prenatal Care Thompson, Amuala, Solenen and Hiilesmaa (2003) – it is a type of preventive health care, it is provided in the form of medical checkups, consisting of recommendations on managing a healthy lifestyle and the provision of medical information such as maternal physiological changes in pregnancy, biological changes, and prenatal nutrition including prenatal vitamins, which prevents potential health problems throughout the course of the pregnancy and promotes the mother and child's health alike (Matsumoto, 2021). He further expressed that availability of routine prenatal care, including prenatal screening and diagnosis, has played a part in reducing the frequency of maternal deaths, miscarriages, birth defects, low birth weight, neonatal infections and other preventable health problems.

In addition, Antenatal Care (ANC) is the care provided by skilled health care professional to women throughout their pregnancy. It includes risk identification and screening, related or concurrent diseases, and health education and promotion. In line with this Global guidelines recommend frequent period to decrease the risk of maternal and prenatal mortality (1 – 3) women are recommended to initiate their ANC appropriately during pregnancy as it will help to reduce complications, provide wider platforms for a healthier pregnancy and maximize the benefits of monitoring fetal and maternal health (Portela, 2017). The World Health Organization (WHO) recommends that ANC should be initiated within the first trimester of gestation with at least four, and optimally eight visits during the pregnancy. Specifically, the WHO advises pregnant women to initiate contact during the first 12 weeks of gestation, with subsequent contacts taking place at 20, 26, 30, 34, 36, 38, and 40 weeks gestation (Portelsa, 2017). This may depend on if these available in a health facility.

Describing health facilities, is any location where health care is provided. Health facilities range from small clinics and doctor's offices to urgent care centres and large hospitals with elaborate emergency rooms and trauma centres (Seyedi, 2017). According to him, the number and quality of health facilities in a country or region is one common measure of that area's prosperity and quality of life. In many countries, health facilities are regulated to some extent by law; licensing by a regulatory agency is often required before a facility may open for business. Health facilities may be owned and operated by for – profit businesses, non-profit organizations, governments, and in some cases by individuals, with proportions varying by country (which is the case in Nigeria). In the are of the study, it can be seen that pregnant women maybe due to enlightenment show a great deal of interest in services of ultrasound as many of them use this services.

World Health Organization (WHO, 2018) recommend that all pregnant women have one ultrasound scan before 24 weeks of pregnancy to estimate gestational age (GA) assess placental placement, determine single or multiple pregnancies, increase fetal abnormality detection, and improve pregnancy outcomes in addition to ultrasound scan when indicated. Furthermore, it can improve the accuracy and precision of GA measurement, making it easier to treat suspected preterm delivery and post-term pregnancies, particularly in low-income settings.

Pregnant women in developing countries (of which Nigeria is one) are more likely to have complications during pregnancy and die and their newborns are more likely to have complications during birth or shortly after delivery; however, many of the problems may be avoided with adequate prenatal care involving ultrasound scan, which is one of the most significant components of prenatal care (Kelvin, 2018).

It is known that sub-Saharan Africa (SSA) has one of the highest levels of perinatal mortality globally, where the estimated perinatal mortality was 34.7 per 1000 births. Intrauterine growth retardation (IUGR) is a major cause of perinatal mortality and morbidity, and ultrasound may be useful in identifying expectant mothers who are at early risk. For example, research in Africa (Egypt, Cario) discovered a rate of infant growth retardation of 11.8%. Approximately 89.7% of these were detected via an obstetric ultrasound scan.

It has been demonstrated that women's understanding and attitude about antenatal ultrasonography are critical, and that it has an impact on their mental health. This is especially true in cases where ultrasonography is being used newly. Despite this, several studies show that women have little awareness of prenatal sonography and have unreasonable expectations and demands which may likely be the case for the present area of the study, hence there is need for this study to answer the following questions.

Research Questions

To give direction to the work, the following research questions are posed:

- i. What are the factors influencing the use of ultrasound services among pregnant women attending antenatal care in Jema'a Local Government Area?
- ii. What are the types of ultrasound services available for pregnant women attending antenatal care in Jema'a Local Government Area?
- iii. What are the factors influencing inappropriate use of ultrasound among pregnant women attending antenatal care in Jema'a Local Government Area?
- iv. What are the health services available for pregnant women attending antenatal care in Jema'a Local Government Area?

Research Hypothesis

To give direction to this study, one null hypothesis was postulated

- i. There will be no significant difference in factors influencing the use of ultrasound services among pregnant women attending antenatal care in Jema'a Local Government Area, based on location.

METHODS

Research Design

The research design adopted for the purpose of this study is the survey research design. According to Abiola (2007) a descriptive research design is a method that describes a given state of affairs at a particular time. It seeks to describe a unit in detail in content and holistically. Descriptive survey research is the most frequently used method to collecting information about people's attitudes, opinions, habits and a variety of educational issues. This was found suitable for the present study.

The population for this study are those pregnant women attending antenatal care in some selected hospitals in Jema'a Local Government Area and obtained ultrasound services for a period of six (6) weeks and their number was 300.

The total population was used because it is a manageable size, as expertise in research suggest that the whole population can be used if is small, which is the case with this study. The instrument for this study is a self-structured questionnaire designed to collect information from the respondents on use of ultrasound among pregnant women attending antenatal care in some selected hospital in Jema'a Local Government Area. There were five sections to the instrument Section A elicited information on the location and it has two options, that is, urban and rural. Section B sought for information on the factors influencing the use of ultrasound among pregnant women attending antenatal care in Jema'a Local Government Area with fourteen (14) items. Section C sought for information on types of ultrasound services available for pregnant women attending antenatal care in Jema'a Local Government and had four (4) items. Section D sought for information on the factors influencing the lack of use of ultrasound among pregnant women attending antenatal care in Jema'a with thirteen (13) items. Section E sought for information on health services available for pregnant women attending antenatal care in Jema'a and it has fifteen (15) items. Form Section B to E, there are only options for each item as the individual is expected to either tick Yes or No.

The questionnaire for this study was validated by four experts in research. One expert from test and measurement and evaluation, one expert from Nursing Science University of Jos and two from Physical and Health Education. A copy of the drafted questionnaire was given to them for the purpose of face and content validation, for the appropriateness of the items, clarity of statements in the instrument, whether or not the items are related to the subject under study.

The observations made by the experts were used in correcting the instrument which was pre-tested using 40 women that attended antenatal care but were not included in the main study.

The information collected from them were analyzed using Cronbach alpha method and a coefficient index of 0.76 which was obtained which was considered high for the study

The researcher and a trained research assistant carried out the distribution of the questionnaire forms the researcher explained to the respondents how to go about responding to the items on the questionnaire before administering it. The questionnaire was retrieved the same day it was administered in order to guide against loss of questionnaire on transit.

Frequency and percentage were used in analyzing the raw data, which was used for answering research questions. A Chi-square was further used in testing the stated hypothesis in the work.

RESULTS

Table 1: Factors Influencing The Use Of Ultrasound Among Pregnant Women Attending Antenatal Care

S/no	Item	Yes		No	
		f	%	f	%
1	Determination of multiple pregnancies	252	84	48	16
2	Gestational age	280	93.3	20	6.67
3	Screening for fetal anomalies	264	88	36	12
4	Fetal viability	272	90.67	28	9.33
5	Availability of support	260	86.67	40	13.33
6	Availability and accessibility of services	250	83.33	50	16.67
7	Improved access to information	240	80	60	20
8	High costs	57	19	243	81
9	Lack of awareness about its benefits	180	60	120	40
10	Education level of the couple	200	66.67	100	33.33
11	Improved Socio-economic status	204	68	96	32
12	Am aware of ultrasound services for pregnant women	250	83.33	50	16.66
13	Quality of services	230	76.67	70	23.33
14	Distance to the health facility	150	50	150	50

The results in the Table 1 revealed that factors influencing the use of ultrasound among pregnant women attending antenatal care are Gestational age 280 (93.3%), fetal viability 272 (90.67%), screening for fetal anomalies 264 (88%), availability of support 260 (86.67%), determination of multiple pregnancies 252 (84%), availability and accessibility of services 250 (83.3%) and am aware of ultrasound services for pregnant women 250 (83.3), others were improved access to information 240 (80%), quality of services 230 (76.67%), improved Socio-economic status 204 (68%), educational level of the couple 200 (66.67%),lack of awareness about its benefits 180 (60%), and distance to the health facility 150 (50%), were the factors influencing the use of ultrasound among pregnant women attending antenatal care.

Table 2: Types of Ultrasound Services Available For Pregnant Women Attending Antenatal Care

S/no	Item	Yes		No	
		f %		f %	
1	Early pregnancy scan(8-11 weeks)	190	63.33	110	36.67
2	Nuclear translucency scan (11- 14 weeks)	185	61.67	115	38.33
3	Early anomaly scan (14-18 weeks)	220	73.33	80	26.67
4	Growth scan or fetal wellbeing scan (24-42weeks)	255	85	45	15

Table 2, revealed that growth scan or fetal wellbeing scan (24-42weeks) has the highest frequency 255 (85%), early anomaly scan (14-18 weeks) 220 (73.33%), early pregnancy scan (8-11weeks) 190 (63.33%) and nuclear translucency scan (11- 14 weeks) 185 (61.67%) were the ultrasound services available pregnant women attending antenatal care.

Table 3: Factors Influencing The Lack Of Use Of Ultrasound Among Pregnant Women Attending Antenatal Care

S/no	Item	Yes		No	
		f %		f %	
1	Facilities available	254	84.67	46	15.33
2	Systematic (organizational)	192	64	108	36
3	Economic status	215	71.67	85	28.33
4	Race and ethnicity	96	32	204	68
5	Age	84	28	216	72
6	Level of education	100	33.33	200	66.67
7	Birth order (experience)	116	38.67	184	61.33
8	Marital status	32	10.67	168	83.33
9	Time waiting for ultrasound services	104	34.67	196	65.33
10	Distance to health facility	128	42.67	172	57.33
11	.Means of transportation	180	60	120	40
12	.Costs of the ultrasound services	156	52	144	48
13	.Satisfaction with the services rendered	275	91.67	25	8.33

The result in Table 3 revealed that satisfaction with the services rendered 275 (91.67%), facilities available 254 (84.67%), economic status 215 (71.67%), systematic (organizational) 192 (64%), means of transportation 180 (60%), and costs of the ultrasound services 156 (52%) were the factors influencing the lack of use of ultrasound among pregnant women attending antenatal care.

Table 4: Types Of Health Services Available For Pregnant Women Attending Antenatal Care

S/no	Item	Yes		No	
		f %		f %	
1	Measurement of weight	256	85	44	14.67
2	Measurement of height	30	10	270	90
3	Vital signs	292	97.33	8	2.67
4	Examination of the ankle for swelling	244	81.33	56	18.67
5	Pelvic examination	264	88	36	12
6	Blood tests	166	55.33	134	44.67
7	Urine tests	230	76.67	70	23.33
8	Test for thyroid hormone level	20	6.67	280	93.33
9	Test of diabetes	246	82	54	18
10	Test for RH factor	8	2.67	292	97.33
11	Test for sickle cell trait or disease	46	15.33	254	84.67
12	Test for tuberculosis	30	10	270	90
13	Test for hepatitis B or C virus	112	37	188	62
14	Ultrasound scanning	240	80	60	20
15	X -ray	18	6	282	94

The results in the table 4 revealed that vital signs has the highest frequency 292 (97.33%), pelvic examination 264 (88%), measurement of weight 256 (85%), tests of diabetes 246 (82%), examination of the ankle for swelling 244 (81.33%), ultrasound scanning 240 (80%), urine tests 230 (76.67%) and blood tests 166 (55.33%) were the types of health services available for pregnant women attending antenatal care.

Chi Square Statistics Test On Factors Influencing Use Of Ultrasound Services Among Pregnant Women Attending Antenatal Care Base On Location

Factors	Observed value		Expected value		Level of significance	X ² Cal	X ² Tab
	Rural Area	Urban Area	Rural Area	Urban Area			
Determination of multiple pregnancies	140	132	10	18	0.05	0.98	75
Gestational age	135	110	40	15			
Screening for fetal anomalies	42	140	10	108			
Fetal viability	109	130	20	41			
Availability of support	111	145	39	5			
Availability and accessibility of services	34	125	116	25			
Improved access to information	78	142	72	8			
High costs	142	50	8	100			

Lack of awareness about its benefits	112	147	38	3			
Education level of the couple	134	90	16	60			
Improved Socio-economic status	89	89	61	65			
Am aware of ultrasound services for pregnant women	109	142	41	8			
Quality of services	118	134	32	16			
Distance to the health facility	143	22	7	128			

Table showed the chi square result for the significant relationship between the factors influencing the use of ultrasound services among pregnant women attending antenatal care in urban areas in Jema'a Local Government Area of Kaduna State. From the table above, it is observed that the calculated X^2 at 0.05 level of significances was 0.98 which is less than the X^2 table 75. This implies that there is significant relationship between factors influencing the use of ultrasound services among pregnant women attending antenatal care based on location.

DISCUSSION

Table 1 shows that the factors influencing the use of ultrasound among pregnant women attending antenatal care are determination of gestational age 280 (93.3%), fetal viability 272 (90.67%), screening for fetal anomalies 264 (88%), availability of support 260 (86.33%), determination of multiple pregnancies 252 (84%), improved access to information 240 (80%), quality of services 230 (76.67%), am aware of ultrasound services for pregnant women 250 (68%), improved Socio-economic status 204 (68%), education level of the couple 200 (66.67%), distance to the health facility 200 (66.67%) and lack of awareness about its benefits 180 (60%). These results were not expected because fetal viability is supposed to be higher than the gestational age.

This finding is in agreement with the finding of Venezuela, Whitworth, Bricker, and Mulla (2015) found low use of ultrasound scan services due to factors such as high costs, poor service coverage as well as lack of awareness about its benefits.

In addition Ugwu, Elugw, and Onyegbule (2016) found increased use of ultrasound scans by pregnant women. This was attributed to factors such as the education level of the couple, especially the head of the household, improved socio-economic status among other factors. While in Kano, Northern Nigeria, there was less utilization of ultrasound scans due to poor coverage of services and lower incomes among other factors.

Discussing further, Spenser and Nicholaides (2015) in Nairobi, Kenya whose study revealed that the use of ultrasound scans by pregnant women was influenced by women's awareness of the services and its benefits, availability of services, customer care, availability of support, poverty, level of education, long distance to health facilities, unavailability of services, perceived low quality of service, and lack of support as well as the quality of services provided among other factors.

Table 2 shows that the types of ultrasound services available for pregnant women attending antenatal care in healthcare facilities in Jema'a Local Government Area of Kaduna State are growth scan or fetal wellbeing scan (24-42weeks) 255 (85%), early pregnancy scan(8-11 weeks) 190 (63.33%), and nuclear translucency scan (11- 14 weeks) 185 (61.67%). This result was surprising because growth scan is higher than nuclear translucency scan.

This finding corresponded with the findings of Srividhya (2022) who pointed out that there are several types of ultrasound scan in pregnancy such as growth scan or fetal wellbeing scan (24-42weeks), early pregnancy scan(8-11 weeks) and nuclear translucency scan (11-14 weeks).

Table 3 shows that the factors influencing the lack of use of ultrasound among pregnant women attending antenatal care are satisfaction with the services rendered 275 (91.67%), facilities available 254 (84.67%), economic status 215 (71.67%), systematic (organizational) 194 (64%), and costs of the ultrasound services 156 (52%). This result was surprising because satisfaction with the services rendered is higher than the economic status.

This finding is in agreement with the findings of World Health Organization (WHO, 2018), where they found that most pregnant women in Sub-Sahara Africa finds it difficult to do ultra sound due to factors influencing the lack of use of ultrasound such as poor economic status, high cost of ultra sound services, educational level and lack of satisfaction with the services rendered to them.

Furthermore, SHSURC (2012) reported that the main barriers to prenatal care were systematic (organizational) patient – related and financial. Two other reports identified some demographic risk factors such as race and ethnicity, age, level of education, birth order, marital status, poverty, geographic location and time trends as barriers to prenatal care Borruto et-al (2002). Financial issues was identified in a number of studies as a major barrier to prenatal care as added by McCourt and Pearce (2014).

Table 4 shows that the types of health services available for pregnant women attending antenatal care in Jema'a Local Government Area of Kaduna State are vital signs 292 (97.33%), pelvic examination 264 (88%), measurement of weight 256 (85%), examination of the ankle for swelling 244 (81.33%), test of diabetes 246 (82%), ultrasound scanning 240 (80%), urine tests 230 (76.67%) and blood tests 166 (55.33%). This result was not surprised because the vital signs are higher than the ultrasound scanning services. This finding is in agreement with the findings of Mittelmark (2022) who found that types of health services available for pregnant women attending antenatal care are first examination after pregnancy is confirmed, the woman should have a physical examination, preferably between 6-8 weeks of pregnancy.

CONCLUSIONS

Based on the findings of the study, it was concluded that different factors influenced the use of ultra sound by the respondents, the different health services available were all used by them.

RECOMMENDATIONS

Based on the findings of the study the researcher recommends that:

1. Due to the facts that distance and cost is one of the major factors influencing the use of ultrasound among pregnant women attending antenatal care, the government should subsidize the cost of ultrasound and open more ultrasound health facilities especially in the rural areas to cut cost and reduce distance.
2. An awareness and sensitization campaign should be carried out to sensitize the pregnant women especially those without formal education on the benefits of the use of ultrasound.
3. More types of ultrasound services should be made available for pregnant women attending antenatal care in healthcare facilities in Jema'a Local Government Area of Kaduna State.
4. Pregnant women attending antenatal care in healthcare facilities in Jema'a Local Government Area of Kaduna State should be encourage to periodically utilize the ultrasound services available.

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