

**UTILIZATION PATTERN OF OBSTETRIC ULTRASONOGRAPHY
AMONG MOTHERS IN KIRYANDONGO HOSPITAL**

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A BACHELOR IN MEDICINE AND BACHELOR IN SURGERY**

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DECLARATION:

I **STEPHEN LORO SIMON** Registration Number **BMS/0031/131/DF**, hereby declare that this document is my original work and has never been submitted to any institution or authority for any purpose; academic or otherwise for any award. All the views expressed in here are mine and where otherwise, due acknowledgement has been made.

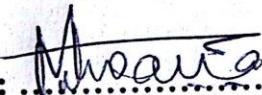
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CERTIFICATION PAGE

I certify that this research proposal was done under my supervision and I recommend it for submission to the Faculty of Medicine and Dentistry for the award of Bachelors in Medicine and Surgery.

SIGN: 

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DEDICATION

I dedicate this study to Kiryandongo General Hospital specially the obstetrics and gynaecology department and them that labour tirelessly for the safety of people's mothers, sisters and wives.

ACKNOWLEDGEMENT

I want to acknowledge The Lord God almighty and His son Jesus Christ for helping me and granting me the grace to come this far in this level of my life despite the storms of this life and the pressures of medical school which many have been taken away therewith.

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DEFINITION OF TERMS

Ultrasound: is an imaging modality used in medicine to view soft tissue using sound moving in frequencies more than 30,000 Hz

Obstetric ultrasonography: it is the use of the ultrasound technique to view fetus in the uterus and all that is related to the fetus anatomically.

Antenatal care: it is a group of health related approaches given to mothers who are pregnant to ensure good pregnancy outcomes.

Multiple pregnancy: presence of one or more foetus in the uterus.

Ectopic pregnancy: presence of foetus in position other than the body of the uterus. It can be in the fallopian tubes, cervix, abdomen, etc.

Malpresentations: Faulty presentation of the foetus; presentation of any part other than the occiput.

Obstructed labour: is labour where in spite of good uterine contractions, the progressive descent of the presenting part is arrested due to mechanical obstruction.

Placenta previa: the condition in which the placenta is implanted in the lower segment of the uterus, extending to the margin of the internal os of the cervix or partially or completely obstructing the os.

Neonatal mortality rate: the number of deaths in the first 28 days of life divided by the number of live births occurring in the same population during the same period of time.

Maternal mortality rate: the number of maternal deaths that occur as the direct result of the reproductive process per 100,000 live births.

Perinatal mortality rate: the number of stillborn infants of 24 completed weeks or more plus the number of deaths occurring under 28 days of life divided by the number of stillborn infants of 24 weeks or more gestation plus all live born infants in the same population, regardless of the period of gestation.

LIST OF ABBREVIATIONS:

ANC:	ANTENATAL CARE
HICs:	HIGH INCOME COUNTRIES
IUGR:	INTRAUTERINE GROWTH RESTRICTION
KIU WC:	KAMPALA INTERNATIONAL UNIVERSITY WESTERN CAMPUS
LMICs:	LOW AND MIDDLE INCOME COUNTRIES
MMR:	MATERNAL MORTALITY RATE
NMR:	NEONATAL MORTALITY RATE
UDHS:	UGANDA DEMOGRAPHIC HEALTH SURVEY
UN:	UNITED NATION
UNICEF:	UNITED NATIONS INTERNATIONAL CHILDREN EMERGENCY FUND
WHO:	WORLD HEALTH ORGANIZATION
US:	ULTRASOUND

ABSTRACT

Background

The use of obstetric ultrasonography has improved the care of pregnant mothers markedly in the High income countries reducing their maternal mortality rates. However in Low and middle income countries the mortality rate is still high probably due to reduced utilization of modalities such as ultrasound. This study aimed at assessing the utilization pattern of obstetric ultrasonography among mothers in Kiryandongo hospital.

Method

A descriptive cross-sectional study with both qualitative and quantitative approach was taking to meet the specific objectives of the study. Self-administered questionnaires were given to the consented participants to answer with a degree of assistance given. The data was analysed using Microsoft Excel 2010.

Results

78% of the participants had knowledge about obstetric ultrasound and 69% of them that know did obstetric ultrasonography. Most of the participants did ultrasound to confirm the sex of their unborn babies. 20% of participants think ultrasonography is not safe for the baby, 13% agree that ultrasound is safe. 26% of the participants thought ultrasound causes cancer. Obstetric ultrasound is readily available 24/7 at 15,000 Uganda shillings per scan. 82% of mothers that attended labour in Kiryandongo Hospital had no ultrasound scan results.

Conclusion

There is a lower level of knowledge in the rural Kiryandongo hospital compared to the more urban areas. There is also a misconception that ultrasonography causes cancer which needs to be dealt with. The availability of the ultrasound services is good but the accessibility is needing due to the fees attached to it.

CHAPTER ONE: INTRODUCTION

1.1 Background

Obstetric Ultrasound is the use of the ultrasound to examine a pregnant woman. It has different indications for all the trimesters of pregnancy and many countries recommend at least one ultrasound scan as part of the standard antenatal care. The World Health Organization recommends an ultrasound exam before 24 weeks of gestation to estimate gestational age, improve detection of foetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy experience (WHO, 2016). In Uganda, it is recommended that all mothers should have an ultrasound scan done in the second or third trimester (Uganda Clinical Guidelines, 2016).

1.1.1 Historical background

In sub-Saharan Africa, women face a 1 in 39 lifetime risk of dying during childbirth. In the developed world, the risk is 1 in 3,800 (Chou D. et al, 2012). In Uganda the Maternal Mortality Rate (MMR) (defined as the number of maternal deaths per 100,000 live births) is 368 as per 2016 survey which is still high (Uganda Demographic Health Survey, 2016) compared to the Sustainable Developmental Goal of <70 death per 100,000 birth to be reached by 2030 (United Nation, 2015). Most maternal deaths are due to causes directly related to pregnancy and childbirth, unsafe abortion and obstetric complications such as severe bleeding, infection, hypertensive disorders, and obstructed labour. In the sub-Saharan region haemorrhage causes 34% of maternal death which includes both antepartum haemorrhage and postpartum haemorrhage. Other direct causes of maternal mortality is at 11% and this include obstructed labour (Countdown 2015: Uganda).

1.1.2 Conceptual background

Assumptions have been made that antenatal ultrasound examination in all pregnancies will prove beneficial by enabling earlier detection of problems that may not be apparent (Whitworth M et al, 2015) – such as multiple pregnancies, IUGR, congenital anomalies, malpresentation and placenta praevia – and by allowing accurate gestational age estimation, leading to timely and appropriate management of pregnancy complications. This will lead to reduction in the delay in management of the mother hence leading to reduced mortality rates. It also allows the early identification of high risk pregnancies and early appropriate management instituted (Dewbury, K.M. 2002).

The neonatal mortality rate was 27 deaths per 1,000 live births (UDHS, 2016). 30% of these neonatal deaths are due to preterm births and asphyxia. This value is high as compared to the Sustainable Developmental Goal which is aiming at reducing the neonatal mortality to as low as 12 deaths per 1,000 live births by 2030 (United Nations, 2015).

1.1.3 Theoretical Background

Doppler ultrasound is widely used in high-risk pregnancies to identify foetal compromise and thus reduce perinatal mortality (Maulik D et al 2010, Alfrevic Z, 2013). It is also useful for distinguishing between foetuses that are growth-restricted (IUGR) and those that are constitutionally small (Soothill PW, 1993) which helps in early interventions and reduced mortality.

1.1.4 Contextual Background

The evidence on ultrasound is derived mainly from High Income Countries (HICs), where early ultrasound is a standard component of Antenatal Care (ANC) to establish an accurate gestational age and identify pregnancy complications. The impact of ultrasound screening in low-resource settings is currently unknown but the low rates of maternal and perinatal mortality experienced in HICs indirectly suggests that ultrasound is an important component of quality ANC services. (WHO, 2016)

Accurate gestational age dating is critical for the appropriate delivery of time-sensitive interventions in pregnancy, as well as management of pregnancy complications, particularly pre-eclampsia and preterm birth, which are major causes of maternal and perinatal morbidity and mortality in Low and Middle Income Countries (LMICs), and early ultrasound is useful for this purpose (WHO, 2016).

Seeing the importance of obstetric Ultrasonography in management of pregnant women, it is evident that its use should be encouraged in our setting to improve the quality of health care service to our pregnant mothers and improve their pregnancy experience.

1.2 Problem Statement

High Income Countries (HICs) has a very low maternal and perinatal mortality rates compared to the Low and Middle Income Countries (LMICs) due to the good level of their antenatal care which has been indirectly linked to the extensive use of ultrasound (WHO, 2016). Though the availability of these diagnostic modalities in Low and Middle Income Countries (LMICs) the maternal and perinatal mortality is still high.

It has been proven that use of obstetric ultrasonography can reduce the risk of induction of labour due to postdating (WHO, 2016), identify foetal anomalies early as well as malpresentations and facilitate early decision making (Whitworth M et al, 2015) and in case of high risk pregnancies early management is effected (Dewbury, K.M., 2002). Ultrasound also has great potential to reduce the maternal and neonatal mortality rate in the developing world (Stanton, Katherine, and Lillian Mwanri, 2013).

Despite all these, ultrasound use is still not improved in our setting where in most of sub-Saharan Africa it is only in urban areas where 30% of pregnant women have an obstetric ultrasound and in rural areas, this figure is estimated to be 6%. So what is causing the high mortality rates despite the development in the technology? Is it the knowledge or the availability and accessibility of the ultrasound machines?

1.3 Objectives

1.3.1 General Objective

To assess the utilization pattern of obstetric ultrasonography among mothers in Kiryandongo hospital.

1.3.2 Specific Objectives

1. To assess the knowledge of mothers in Kiryandongo Hospital concerning the use of Obstetric ultrasound
2. To assess the availability of obstetric ultrasound services in Kiryandongo hospital
3. To determine the number of woman who attend labour with at least one obstetric ultrasound scan results

1.4 Research Questions

1. How much do the mothers attending Kiryandongo hospital know about obstetric ultrasonography?
2. How available is the obstetric ultrasound services in Kiryandongo Hospital?
3. How many mothers come to labour with at least 1 obstetric ultrasound scan results?

1.5 Justification

This research is important because it will assess the knowledge of mothers about obstetric ultrasonography which directly or indirectly affects their utilization of the technology. Since it is the first of its kind in Kiryandongo Hospital it will act as a baseline for the utilization pattern of obstetric ultrasonography for further comparative studies. This will further avail information to the health system to which will allow for further study of the factors which affect the utilization of obstetric ultrasonography. It will also help the hospital to reassess their policies concerning obstetric ultrasonography which may help improve its utilization hence improvement in antenatal care provision and maternal and perinatal mortality rate in our road toward the attainment of the Sustainable Developmental Goals of 2030.

1.6 Study Scope

1.6.1 Content Scope

This study will investigate the utilization pattern of obstetric ultrasonography in Kiryandongo Hospital. It will also strive to assess the knowledge of mothers towards obstetric ultrasonography and the availability of ultrasound services in the hospital.

1.6.2 Geographic Scope

This study will take place in Kiryandongo General Hospital which is located 221 kilometres from the capital Kampala along Kampala- Gulu highway. It belongs to Kibanda county of Kiryandongo district. It's at latitude: 1.879439, and longitude 32.061950.

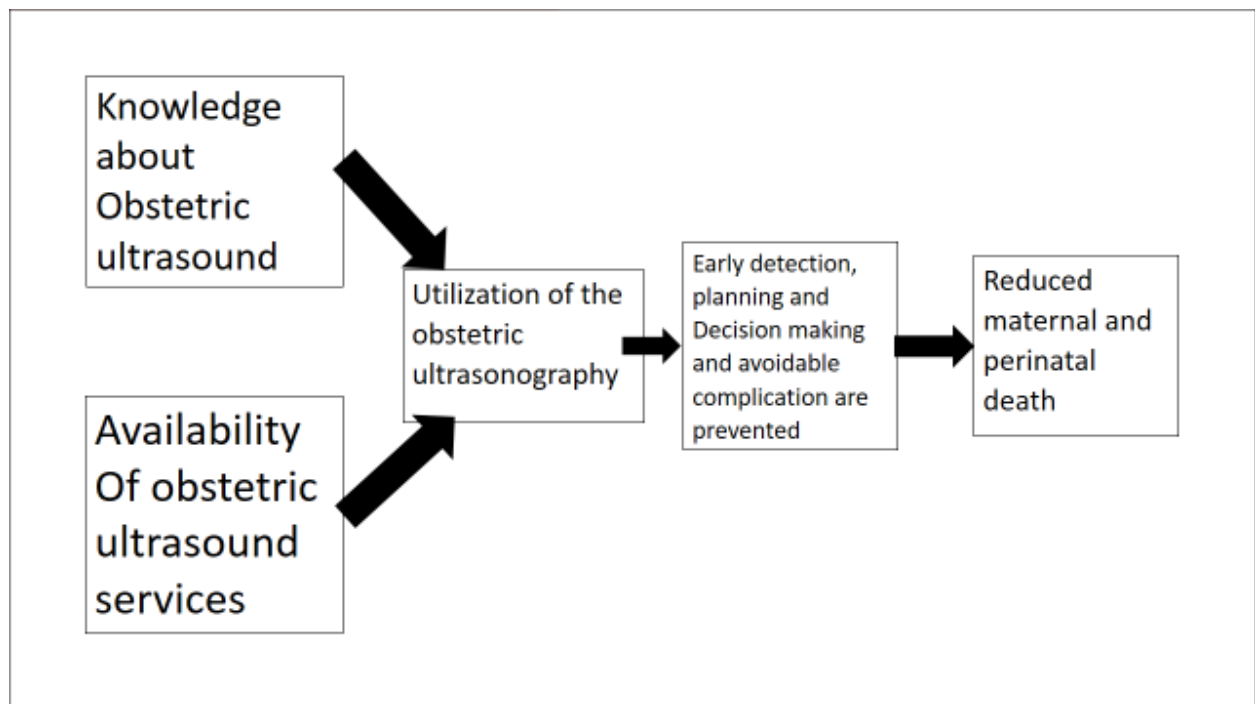
1.6.3 Time Scope

This study was carried out between November and April. November to December was for proposal writing and approval. January to February was for approval by Kiryandongo Hospital Administration. March was for collecting data and analysing data. April was for discussing and concluding the research dissertation.

1.7 Conceptual Framework

The knowledge and availability of obstetric ultrasound services will determine how much the mothers will consider utilizing it. This will determine how much abnormalities are detected and planned for before they arise and avoidable complications are prevented hence improving the maternal and neonatal mortality rates in our way towards attaining the Sustainable Developmental Goals of 2030.

Figure 1.1- Conceptual Framework



CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction:

Obstetric ultrasound helps in the diagnosis of many obstetric conditions which many times lead to increased maternal mortality rates. This includes ectopic pregnancy, incomplete abortions, multiple pregnancy, placenta previa, placenta abruptio, malpresentations (Kumar, R.M., 1995) and it also helps in the accurate analysis of the gestation age and the WHO recommends at least one obstetric ultrasound scan before 24 weeks to estimate gestational age, improve detection of foetal anomalies and multiple pregnancies, reduce induction of labour for post-date pregnancy, and improve a woman's pregnancy experience (WHO, 2016).

In a study in United States it was seen that ultrasonography is more accurate than fundal height estimation with an accuracy of 96% versus 80% and this helped in the diagnosis and management of preterm labour (Shah S, Teismann N, Zaia B, et al, 2010). Ultrasound decreased the delay to diagnosis of ectopic pregnancy from 43% to 29% also decreased the rates of missed ruptured ectopic pregnancy from 50% to 9% (Mateer JR, Valley VT, 1996).

In Zambia, one study demonstrated the effectiveness of obstetric ultrasound performed by midwives to determine whether ultrasound skills could be imparted to nurse midwives, 100% of the nurses experienced a positive change in their practice and there was a 17% change in management of the patients (Kimberly HH, Murray A, 2010). In Tanzania, ultrasound performed by trained midwives also aided in the diagnosis of 39% of patients and changed management in 22% of the patients (Stein W, Katunda, 2008) and 30% in another research done in Botswana (Adler, D., et al., 2008).

2.1 Knowledge about Obstetric Ultrasound

A working knowledge about any material influences how our practice toward the material greatly and that could either be positive or negative. This is also true in this matter we are to examine so the knowledge about this need to be examined before the utilization is examined.

A 2012 study in Nigeria to assess the knowledge of the use and indications for obstetric ultrasound among women attending a main referral hospital has showed that majority (96.4%) of the mothers who participated in the study had good knowledge about the use of obstetric ultrasound. Among the participants 31.3% felt too many ultrasound scans are harmful to the baby while 13.8% also

felt it could lead to cancer (Oche M. Oche¹ et al, 2012). Even though this study shows a good level of knowledge among the participants, the research was done in a more urban setting and 53.3% of the respondents had tertiary level education while 5.6% had only primary level education. This shows the majority i.e. more than 55% has a formal education which influenced their knowledge.

In Tanzania, women revealed acceptability of obstetric ultrasound scan however majority did not have understanding of what the procedure involved or the benefits from having it done. They also had overestimation of the diagnostic benefit of ultrasound; this was also seen in Nigeria and Botswana (Kotlyar, S. and C.L. Moore, 2008). This reveals a gap in the knowledge about obstetric ultrasonography.

A study in Uganda which assessed the effects of introducing a low cost obstetric ultrasound scan in ultrasound naïve region revealed that there was an increased level of antenatal interventions after the introduction of ultrasound scan in that region (Andrew B Ross, 2014). This shows a relevant information indirectly about their knowledge about obstetric ultrasonography since its introduction as a new thing improved the antenatal turn out.

Another study in Uganda also demonstrated that all the participants had a knowledge about obstetric ultrasonography even though the knowledge varied according to level of education, parity and occupation; as nurses revealed a higher level of knowledge than the secondary school teachers and those who are illiterate. However, all the 30 women in this study expressed that they know ultrasound may lead to cancer, regardless of their level of education. When asked about the source of this knowledge, it was a common thread that they had got it from their friends. (Mubuuke Aloysius Gonzaga, 2009). In this study it was also found that 66.7% of the participants showed a positive attitude towards obstetrics ultrasonography and some even go for sonography even when it was not requested and some even go ahead and ask the doctor for an ultrasound request. This is consistent with the study done in Nigeria and this reveals a gap in the knowledge of the mothers towards ultrasonography and might affect the way they utilize this particular technology. However the sample size of this study (30) may make conclusion a fallacy. This study was also done in the more urban Kampala city and the literature for the more rural areas like Kiryandongo is missing so far.

2.2 Availability of obstetric ultrasound services

Availability of the obstetric ultrasound services will definitely influence its utilization.

In western medicine, obstetric ultrasound has achieved almost universal coverage (Dewbury, K.M., 2002). However, It is generally accepted that in rural and remote areas of low- and middle-income countries (LMICs) diagnostic imaging is often insufficient, and in some instances completely lacking (Ostensen H, 2000). In Rwanda, the introduction of obstetric ultrasound in 2 rural hospital saw a great change in patient care and most of the scans were done for obstetric cases (Shah SP, Epino H, Bukhman G, et al, 2009). This may necessitate that availability of these systems influence how people will use the technology even though that is not definitely true since some other factors may also influence its use.

In Tanzania, nurse midwives, trained in basic obstetric ultrasound, were available to perform studies 24 h/day, whereas specialized ultra-sonographers performing advanced ultrasound (including foetal biometrics) were only available during daytime hours (Stein W, Katunda, 2008) this reveals a reduced expert availability in performing the scans 24h/day which might reduce the quality of the results obtained.

One study which assessed the performance of imaging health systems in five selected hospitals in Uganda revealed that there was a low performance levels in imaging health system and this was attributed majorly to the lack of funding in this area. It was also seen that the more urban hospital i.e. Mulago National Referral Hospital which participated in the research had a higher utilization rate than the more rural i.e. Masindi General Hospital (Michael G. Kawooya et al, 2012).

Ultrasound services have been decentralized in Uganda to lower health facilities in order to bring services nearer to people (Mubuke AG et al, 2010) however data on its utilization is yet to be firmly established.

In a rural clinic in Uganda, a “magnet effect” has been showed in the turnout of pregnant mother to antenatal care after introduction of low cost obstetric ultrasound (Ross AB, DeStigter KK, 2013). This again shows an association between the availability and the cost of the obstetric ultrasound and its utilization even in the rural areas as this study has already demonstrated.

Also, specialized radiologists are very few and majorly present in the more urban areas and thus radiographers/sonographers who are less experienced and less knowledgeable are the ones

performing most of the examinations and consultation in case need arises becomes difficult (Mubuuke Aloysius Gonzaga, 2010). So even though the system is available, expert care by a radiologist may not be available in rural areas.

2.3 Number of woman in labour with at least one obstetric ultrasound scan results

In western medicine, obstetric ultrasound has achieved almost universal coverage and is a routine part of accepted antenatal care (Dewbury, K.M., 2002). In developed countries it is common practice for pregnant women to receive two screening ultrasounds, with further scanning in high risk pregnancies (WHO, 2012). This was in line with another research done in the rural China whereby 96.1% of women received obstetric ultrasonography and an average of 2.55 scans per woman and out of this 46.8% received at least 3 scans (Kun Huang et al, 2012). This is probably due to the high rate of Antenatal care turn over which was 96.8%. And this research was done in a high income country and cannot be used to conclude on matters of Uganda which is a low income country.

A research done to study the utilisation of obstetric sonography at a peri-urban health centre IV in Uganda revealed an overuse of obstetrics ultrasonography with 53.4% were counted inappropriate. 56.5% were ordered for serial monitoring of growth, 32.3% were inappropriately timed, and 11.2% were ordered because of a technical problem i.e. as a repeat scan. In this study each mother had an average of 2.2 scans. Possible reasons for the scan was inappropriate of the clinicians who ordered for the scans as well as few radiologists who are not always on ground who can offer a specialized and accurate results which would reduce the need for repeat scans, another reason was that patients requested for scans themselves leading to increased rates of scans (Mubuuke Aloysius Gonzaga, 2010). This study was also done in a peri-urban area and not in a rural area and being retrospective, the data were amenable to weak inferences as it was assumed that all of the relevant information needed had been recorded in the charts of mothers and new born and on the ultrasound request forms. Many of the ultrasound request forms lacked some vital data like menstrual history which would help to compare the gestation age with that of the scan and avoid disparities and wrong conclusions

CHAPTER THREE: METHODOLOGY

3.1 Study Design

A descriptive cross-sectional study was employed in this study and this included a qualitative approach that examined the knowledge level concerning the obstetric ultrasound uses and dangers. A quantitative method of study was adopted for this research to measure the number of women coming at labour with at least one ultrasound scan. It also sought to determine the number of women who have knowledge about obstetric ultrasound, its uses and benefits. It also took a cross-sectional approach as it is a cheap and convenient approach for students because of the limited time availability and resource to carry out a study.

3.2 Study Area

This study was done in Kiryandongo General Hospital antenatal clinic, labour ward and the radiology department to assess for the availability of the ultrasound machine.

Kiryandongo General Hospital is located 221 kilometres from the capital Kampala along Kampala-Gulu highway. It belongs to Kibanda county of Kiryandongo district. It's at latitude: 1.879439, and longitude 32.061950.

3.3 Study Population

This study was carried out among pregnant women attending antenatal clinic in Kiryandongo Hospital, those in the labour unit for delivery and postnatal mothers who have just delivered. It included mothers of all parity and education levels.

3.4 Sampling Method

The study took a convenience sampling method for those that will consent because this one depends on the mothers who are available at that time of data collection. And the information for the availability of the ultrasound scan was obtained from the radiology department head. The information concerning the number of pregnant mothers who have ultrasound was taken from the files in the labour suit of those that have delivered using a convenience sampling method also.

3.5 Sample Size Determination

The research sample size was determined using Fisher's formula of 1986 which states that:

$$n = \frac{z^2 pq}{d^2}$$

Where **n** = minimum sample size.

z = standard deviation at the desired degree of accuracy (95%). Since our desired degree of accuracy is 95%, then **z** was 1.96.

p = Estimated prevalence. The women of reproductive age in Kiryandongo district is 20%

So $p=0.2$

q = $1-p$

d = the acceptable degree of error. Since the desired accuracy is 95%, the acceptable error will be 5% (0.05).

$$n = \frac{1.96^2 \times 0.2(1 - 0.2)}{0.05^2}$$

$$n = \frac{3.84 \times 0.16}{0.0025}$$

$$n = \frac{0.61}{0.0025}$$

$$n = 244$$

But due to financial limitation and the time period the study took a sample size of 50.

A Similar research also in Naguru Health Centre II was done and a sample size of 30 was taken and it gave a saturation in the respondents' answers (Mubuuke et al 2009).

3.6 Data Collection Method

A self-administered questionnaire was given to the selected participants to answer after briefing them and getting informed consent. Assurance of confidentiality was given to avoid bias in answering the questions. The questionnaire had both open and closed ended questions. For the mothers attending antenatal care they were selected after finishing their examinations as they wait for the laboratory results of their needed tests and they submitted the questionnaire before leaving the hospital. For the women attending delivery, those selected were asked to fill the questionnaire in their selected time before being discharged after delivery.

Assistance was offered for those who required on understanding the questions to avoid misinterpretation of the questionnaire.

For the availability of the ultrasound, the radiology department was visited and a separate open ended self-administered questionnaire was filled by the department staff (sonographer).

For getting the number of mother who attended Kiryandongo labour suit, the researcher went to the files of the mothers that have delivered and counted the number of them with ultrasound scans.

3.7 Data Quality Control

The questionnaires was in as simple English as possible to avoid misunderstanding.

For those unable to read but understands and speaks English, the questionnaires was orally read to them and assistance was given to answer the questions.

Explanations was given to the participants requiring help to understand the terminologies.

3.8 Data Processing

The data collected was assessed and the incompletely answered questionnaires were excluded and the ones legible for examination were kept together.

The data collected was analysed manually using scientific calculators in predesigned tables. Some of the informations were tallied and then the figures manipulated to derive percentages and any derivations relevant to interpretation of the raw data to be obtained. Microsoft excel 2010 was used to compute the obtained data.

3.9 Statistical Methods

Statistical charts was produced using Microsoft Excel 2010 to assist in easier examination and interpretation of the data being analysed.

3.10 Ethical Consideration

The research proposal was submitted to the administration of Kiryandongo General Hospital for approval. After the approval an introductory letter was obtained from Kampala International University to Kiryandongo General Hospital and was signed stamped by the Medical superintendent and then the data collection process started.

3.11 Privacy and Confidentiality

The participants' names and hospital numbers were not required in the questionnaires. During the data collection time no person was allowed to examine the data collected except the persons

assisting in conducting the study. After submission of the dissertation the questionnaires were discarded.

3.12 Informed consent

The participants were informed about the research and were assured that participation is totally voluntary. The participants were informed that they can choose to stop at any level even after starting to answer the questionnaires. They all signed an informed consent form prior to answering the questions.

3.13 Participant selection

3.13.1 Inclusion Criteria

1. Mothers who consented
2. Mothers of any parity or gravidity
3. Mothers of all background in the catchment area of Kiryandongo Hospital

3.13.2 Exclusion criteria

1. Mothers who were in active stage of labour
2. Mothers who were referred from areas not including the catchment area of Kiryandongo hospital
3. Mothers who had ultrasound scans done after delivery
4. Mothers who neither read nor speak English

3.14 Risks and benefits

The study was only done for academic purposes. There were neither risks nor monetary benefits to the participants since it only involved answering the questionnaire. The researcher did not have any monetary benefits from carrying the study.

3.15 Limitations of the Research

Financial deficit reduced the amount of the participants enrolled in the study making conclusions to be drawn from few samples.

The time limit of the study was short and with other academic activities, a large sample size could not be adopted for a more comprehensive knowledge

Some mothers were not willing to answer the questionnaires because of time.

Translation of the questionnaires was not done and other mothers among the population were not able to enrol even though willing.

3.16 Dissemination

This study was handed in to KIU faculty of medicine and dentistry as part of requirement for award of a Bachelors of Medicine and Surgery.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.0 Introduction

This chapter contains the analysis of the information which was got from the participants in the research

4.1 Bio data

Out of the 50 participants in the study, 66% of them were between the age of 20-30, 20% were between 30-40, 12% were below 20 and only one participant was above the age of 40.

46% of them were Christians, 26% Muslims, 20% Seventh Day Adventist, and 8% were others such as Pentecostals and Catholics.

Out of the 50 participants, 84% were married and 16% were single mothers. Out of them majority (54%) were having between 2-4 children, 24% were primi gravida and 22% were multiparous i.e. with five or more pregnancies.

14% of the participants had no formal education and 8% attained up to the university however the majority (44%) of the participants attained secondary school and 34% ended in primary school. 70% of these mother are housewives while the remaining 30% are working this included two teachers, a nurse, accountant and others who are in business, saloon keepers etc.

76% of the participants did not have any experience with ultrasound scan and only 24% had ultrasound scan for purposes other than obstetric use.

AGE	<20	20-30	30-40	>40
Number of participants	6	33	10	1
Percentage	12.00%	66.00%	20.00%	2.00%

Table 5.1 A table showing the age distribution of the participants

RELIGION	NUMBER	PERCENTAGE (%)
Christian	23	46
Muslim	13	26
Adventist	10	20
Others	4	8

Table 5.2 A table showing the religion groups of the participants

MARITAL STATUS	Married	Single
Number of participants	42	8
Percentage	84.00%	16.00%

Table 5.3 A table showing the marital status of the participants

NUMBER OF CHILDREN	≤1	Two-Four	≥5
Number of participants	12	27	11
Percentage	24.00%	54.00%	22.00%

Table 5.4 A table showing the number of children of the participants

LEVEL OF EDUCATION	Never Attended	Primary	Secondary	University
Number	7	17	22	4
Percentage	14.00%	34.00%	44.00%	8.00%

Table 5.5 A table showing the level of education attained by the participants

4.2 Knowledge of obstetric ultrasound

Out of the 50 participants, majority (78%, n=39) have knowledge of obstetric ultrasound and only less than a third (22%, n=11) had no knowledge about it. Out of those that had knowledge of obstetric ultrasound 69% (n=27) did obstetric ultrasound and 30% (n=12) did not do the scan and none of them that did not know about obstetric ultrasound scan had done the scan.

There was a difference in the knowledge depending on the level of education of the of the patients for example, the nurse that participated knew much concerning the uses of obstetric ultrasound as

well as the two other teachers with exception of one or two parameters that they did not have any knowledge about.

Majority (n=29) of the participants knew ultrasound is for confirming pregnancies and only one knew that ultrasound is for detecting the position of the fetus in the uterus (Figure 4.2). Out of them, the majority did ultrasound because they wanted to see the sex of the fetus and none did it to look for umbilical cord abnormalities and bleeding inside the uterus (Figure 4.3).

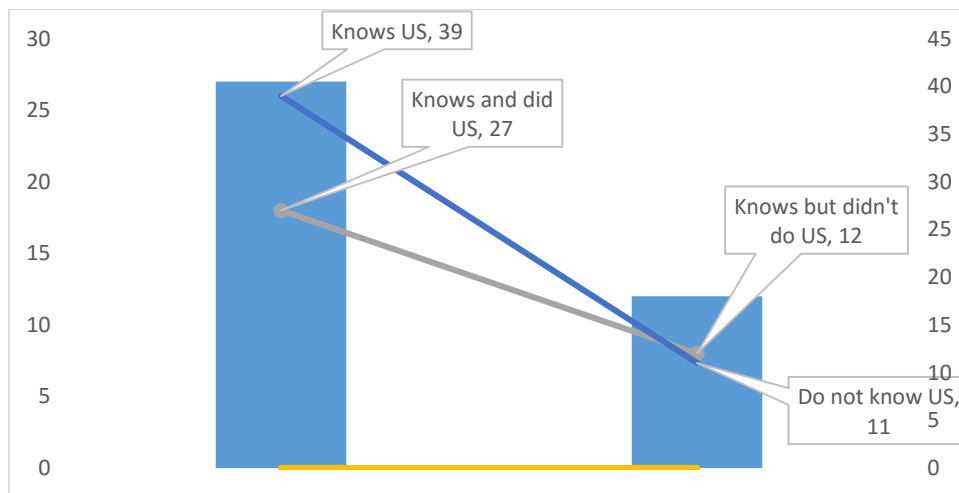


Figure 4.2 A Chart comparing the amount of knowledge about obstetric ultrasound scan and doing the obstetric ultrasound scan

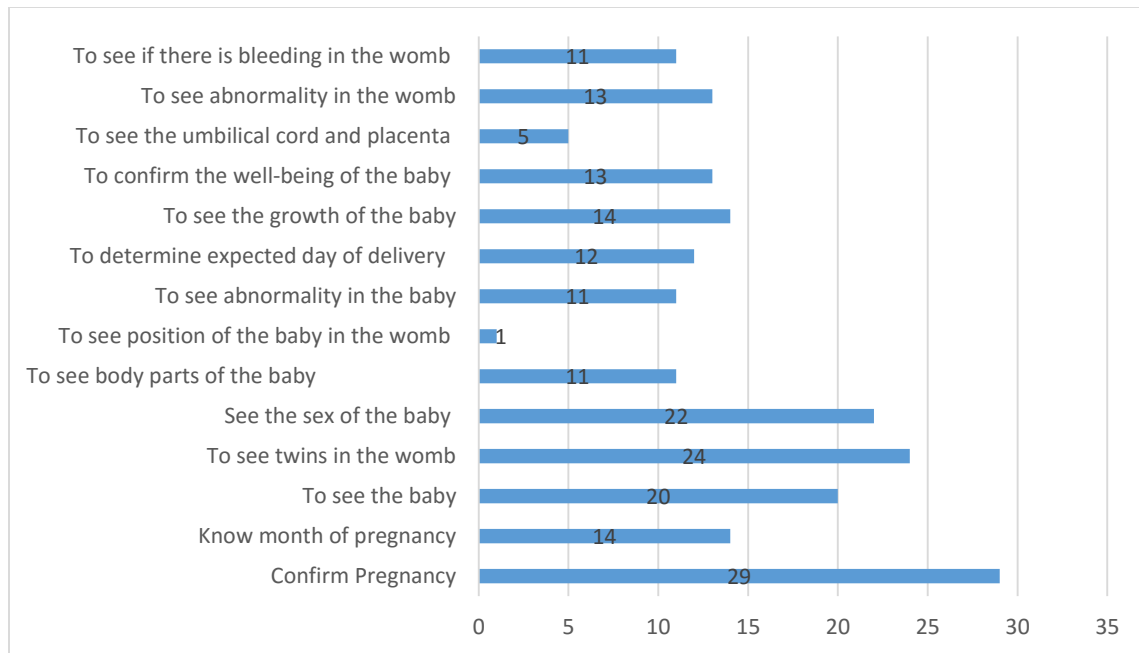


Figure 4.3 A bar chart showing the knowledge of the uses of obstetric ultrasound among participants

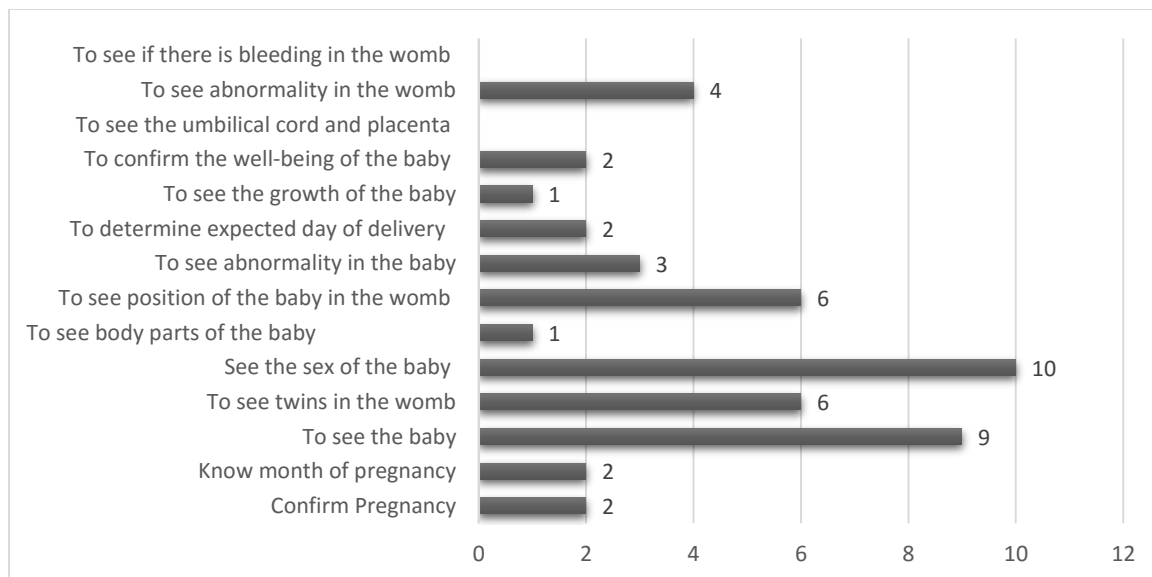


Figure 4.4 A bar chart showing the reasons of the participants of doing an obstetric ultrasound scan

4.3 knowledge about the dangers of obstetric ultrasound

Out of the 39 participants that had knowledge about obstetric ultrasound, 54% (n=21) would love to do obstetric ultrasound every time they are pregnant and 46% would not love to do obstetric ultrasound every time they are pregnant (Figure 4.4).

About 66% (n=26) of the participants do not know whether ultrasound is a safe procedure. While 7% (n=3) strongly agree that ultrasound scan is safe for the baby, 20% (n=8) did not agree that it is safe giving reasons such as interference with bone formation, destroy body part of the baby, reducing the lifespan of the fetus, causing fetal abnormalities in the parts, causing enlargement of the organs, causing deformity and causing cancer (Figure 4.5).

26% (n=10) of the participants that knew about obstetric ultrasound believed that ultrasound causes cancer while the majority (74%, n=29) believed that it doesn't cause cancer (Figure 4.6).

About 59% of the participants sourced their information from nurses followed by doctors with 28% and friends with 10% and then television or radio and one participants got information from the nursing school. None of them sourced information from the internet or any other source.

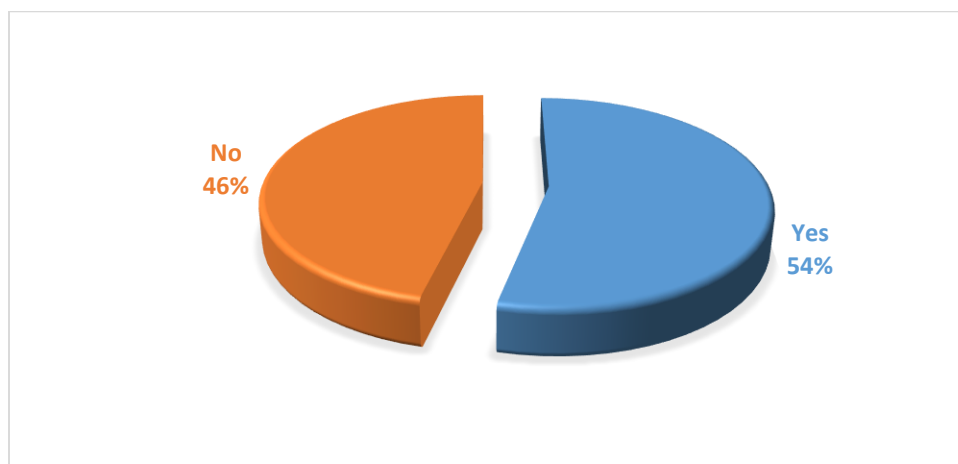


Figure 4.5 A pie chart showing the number of participants who would like to do an ultrasound scan in every pregnancy

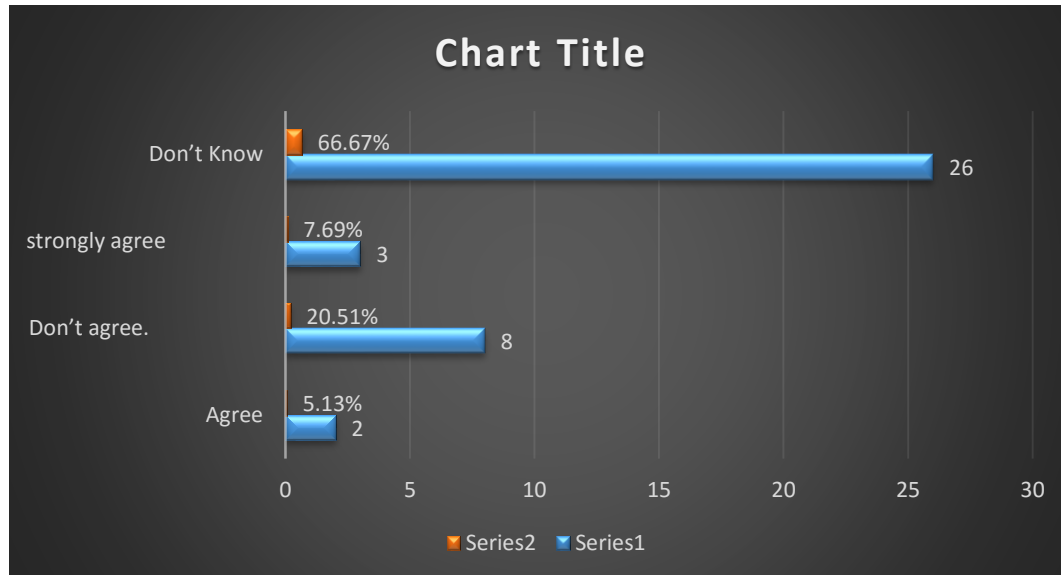


Figure 4.6 A bar chart showing the knowledge about the safety of obstetric ultrasound

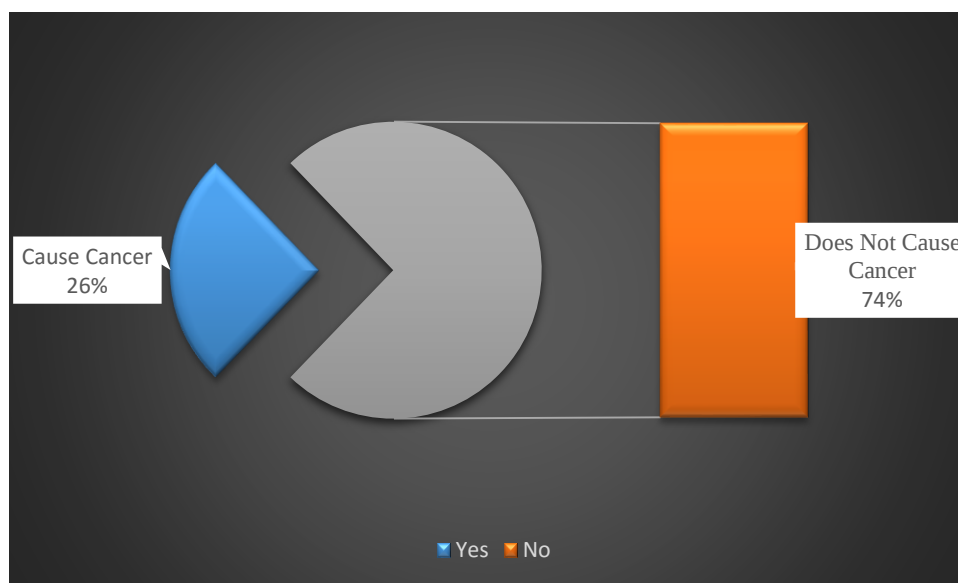


Figure 4.7 A pie chart showing the believe that ultrasound scan can cause cancer

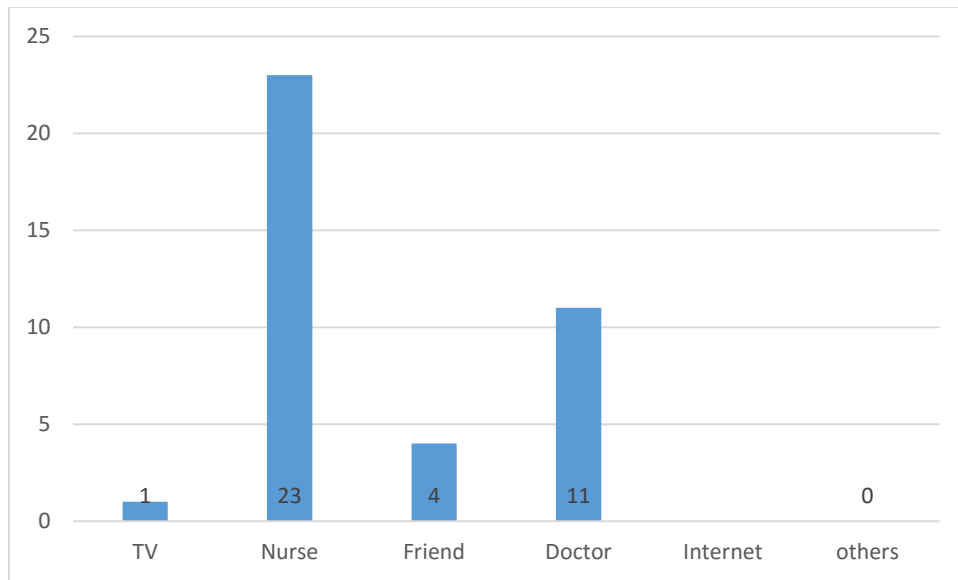


Figure 4.8 A bar chart showing the source of information about ultrasound

4.4 Availability of obstetric ultrasound scan in Kiryandongo Hospital

There are two ultrasound machines in Kiryandongo Hospital and both are functional. One came as a donation and the other is property of the Government of Uganda. The ultrasound scans are usually done by a sonographer and interpreted by a sonographer because there is no radiologist in the hospital.

The scan is available every day including weekends 24 hours a day. The patients can get scans easily by either a prescription from a doctor or clinical officer or by self-requesting a scan. However, it is not free and for each scan a fee of 15,000 Uganda Shillings is paid.

Apart from Kiryandongo Hospital there is one centre in Kiryandongo town that offers ultrasound scan services and others are in the next towns to Kiryandongo.

4.5 Number of woman in labour with at least one obstetric ultrasound scan results

Out of a sample of fifty mothers taken around the period of the study who were in labour in Kiryandongo General Hospital obstetrics and gynaecology department only 18% (n=9) had at least one ultrasound scan results at hand while the majority (82%) had no ultrasound scan result.

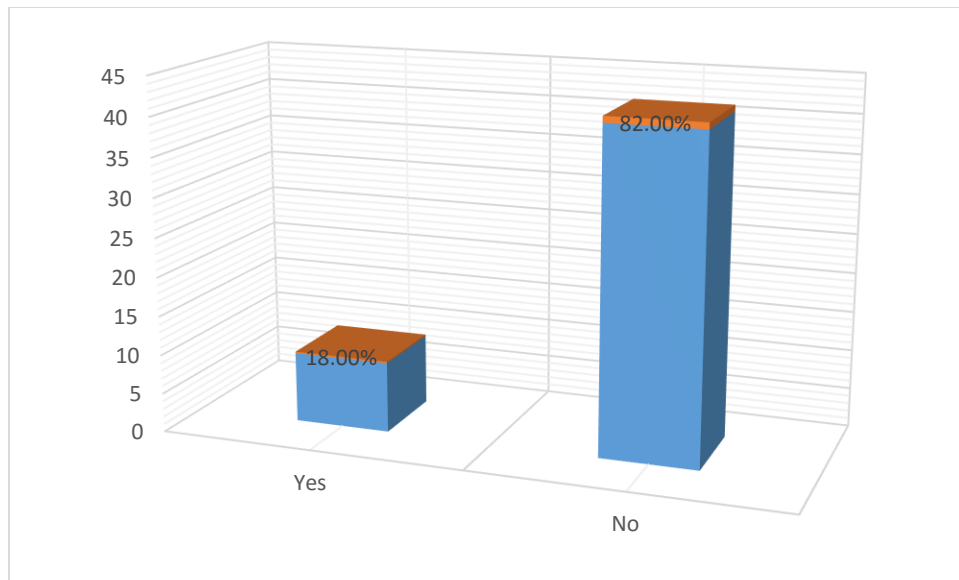


Figure 4.9 A bar chart showing the number of mothers in labour with at least one ultrasound scan

CHAPTER FIVE

DISCUSSION

5.1.1 Knowledge about uses of obstetric ultrasonography

In this study 78% of the participants knew about obstetric ultrasound and this is lower than the results obtained from the study done in Nigeria where 96.4% (Oche M. Oche1et al, 2012) and that got from Uganda where all 100% had knowledge about obstetric ultrasound (Mubuuke Aloysius Gonzaga, 2009). However, because those studies were done in urban and semi-urban regions respectively, it means that there is a discrepancy in the knowledge from the urban to the rural area with the urban having better knowledge compared to the rural area where this study was carried on. Also the study in Uganda that showed 100% knowledge of the participants about obstetric ultrasound, the sample size was 30 which is small compared to this study where a sample size of 50 was adopted.

Comparing this results to that obtained in Nigeria, 53.3% of the participants had in that study, a tertiary education while in this study, only 8% had attained a tertiary level of education. This large discrepancy has influenced the knowledge about obstetric ultrasonography and hence the disparity in the knowledge between the two groups. This is also true since the nurse and teachers in this study has showed higher level of knowledge about obstetric ultrasonography which further consistent with the finding in the study done in Uganda where nurses also showed a higher knowledge about the procedure compared to others that had lower educational attainments. The nurses had higher knowledge compared to the teachers and the accountant who participated in this study, this shows that the occupation also has an impact in the knowledge concerning obstetric ultrasonography.

Out of those that had knowledge of obstetric ultrasound 69% did obstetric ultrasound and 30% did not do the scan and none of them that did not know about obstetric ultrasound scan had done the scan. This confirms that the knowledge about obstetric ultrasonography influences its use and hence the benefits.

Majority of the participants agreed that obstetric ultrasound is to confirm pregnancy followed by detecting twins and seeing the sex of the baby however very few knew about the detecting structural defect in the placenta and umbilical cord (10% of the participants) and detecting the

position of the fetus (2% of the participants). This is in agreement with a study done in India (Krishnamoorthy N et al, 2016) and Nigeria (Oche M. Oche et al, 2012) where only 19.8% and 17.5 % of their participants were aware that ultrasound was used to rule out structural malformation. In this study majority of the participants did ultrasound to detect the sex of the foetus followed by seeing the foetus as their main reason to do obstetric ultrasound while none of them considered doing ultrasound for reason of detecting placenta abruptio or previa in the womb as a reason to do an obstetric ultrasound scan. This is also in line with the same study done in India and Nigeria where 69% of the participants wanted to know the sex of the foetus to start buying for their expected baby.

5.1.2 Knowledge about dangers of obstetric ultrasound scan

There is still a great gap concerning the dangers of obstetric ultrasound as evidenced by the great number of the participants who did not know whether obstetric ultrasound is safe for the fetus or not. There is also a lot of doubt concerning the absolute safety of the procedure where only about 7% of the participants strongly agreed and 5% only agreed that it is safe and 20% of the participants absolutely disagreed that it is safe to the fetus giving many reasons such as interference with bone formation, destroy body part of the baby, reducing the lifespan of the foetus, causing foetal abnormalities in the parts, causing enlargement of the organs, causing deformity and causing cancer. This finding is conflicting with that found in India where 88% of the participants knew that ultrasound is safe for both the foetus and the mother. However it agrees with the finding from Nigeria where 31% of the participants felt that the procedure is not safe for the foetus. So there appears to be a disparity in the knowledge concerning the safety of ultrasound between the urban and the rural areas.

As concerning ultrasound causing cancer, 74% of the participants knew that ultrasound scan does not cause cancer and the remaining 26% had the belief that ultrasound causes cancer. This is in agreement with the study done in Nigeria 86% of the participants agreed that ultrasound does not cause cancer (Oche M. Oche et al, 2012). However it is not in agreement with the study done in Naguru Health Center, Uganda (Mubuke Aloysius Gonzaga, 2009) where all the participants regardless of the occupation thought that ultrasound could lead to cancer. This could be explained because of the source of information since in Naguru Health Center the participants sourced this information from their friends while in this research most of the knowledge concerning obstetric

ultrasound is sourced majorly from nurses followed by doctors who have a better understanding concerning ultrasound compared to the general population.

5.2 Availability of obstetric ultrasonography

In Kiryandongo General Hospital the ultrasound scan is readily available when needed. This is consistent with the study done by (Mubuuke AG et al, 2010) where the ultrasound machines have been decentralized to bring services nearer to the rural areas. However the accessibility is the issue in that for every scan done the patient has to pay 15,000 Uganda shillings. This is not easily affordable for this community seeing that most of them depend on little income from farming and small business. This to some extent limits the level of its utilization.

There is also no expert radiologist to do and interpret the scans and since ultrasound scans are user dependent, the level of expertise from the sonographer is not adequate enough for interpreting more detailed results which might be necessary to help in the management of the patients. This is consistent with the finding by (Mubuuke Aloysius Gonzaga, 2010) who found that the expert radiologists are few and located more in the urban than the rural.

5.3 Number of woman in labour with at least one obstetric ultrasound scan results

Even though the obstetric ultrasound scan is available in Kiryandongo Hospital the utilization rate is very poor seeing that only 18% of the research participants in labour had ultrasound results. This could be partly due to the reduced accessibility of the ultrasound due to the price tag to it where many cannot afford here and also it could be due to the lack of knowledge concerning ultrasound scan and the misconception that ultrasound can cause cancer and other deformity in the foetus. This is contrary to all the studies that have been cited including that done by (Mubuuke Aloysius Gonzaga, 2010) in Ndejje Health Centre IV a peri-urban health centre in Uganda where pregnant mothers had a mean of 2.2 ultrasound scans by the time they were in labour. It was also not in line with a research done in a rural china where all the mothers had a mean of 2.5 scans by the time of delivery. So there seems to be a great difference between the utilization of obstetric ultrasound scan between the rural and urban regions with the latter showing a greater utilization rates.

CONCLUSION

The urban areas have better knowledge of obstetric ultrasonography than the rural and a better utilization rate in the urban than the rural centres.

The level of education and occupation affects the knowledge about obstetric ultrasonography

Knowledge about obstetric ultrasonography influences its use and hence the benefits out of the use.

There is lack concerning knowledge about the safety of ultrasound scan because of the source of information

Ultrasound scan services are readily available in Kiryandongo general hospital but the accessibility is limited by the fee attached to it.

Very few number of pregnant mothers have ultrasound scans by the time they were in labour in Kiryandongo General Hospital.

RECOMMENDATIONS

More health talks need to be done to enhance the knowledge of mothers towards obstetric ultrasonography and also to remove the wrong information about the safety of obstetric ultrasonography especially concerning it causing cancer.

More research need to be done in this area to assess the factors that influence the low level of utilization of obstetric ultrasonography among mothers attending labour in Kiryandongo Hospital.

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APPENDICES

APPENDIX 1: INFORMED CONSENT PAPER

I am a student of Kampala International University Western Campus, Kiryandongo site who is doing Bachelor of Medicine and Surgery in fifth year. Am conducting this research as one of the requirements for completing the course. It is meant only for academic purposes and no party is getting any financial gain out of the study. The objective of the study is to know the utilization of the obstetric ultrasound among pregnant women who attend Kiryandongo Hospital and the information from this may help in improving the services and hence experience of mothers in pregnancy with the use of ultrasound.

The information which is got from you will not be seen by anybody else except the researcher and your name will not be included so no one will know that it is whose questionnaire is whose even the researcher.

Participation is out of will and there is no harm on not participating and there's no direct benefits like money in participating.

You can choose to leave the research at any time without harm.

Your cooperation is highly appreciated.

Yours sincerely,

Stephen Loro Simon

I accept to participate in this study

Signature/initials: _____

date: ____/____/2018

APPENDIX 2: QUESTIONNAIRES:

TO THE PARTICIPANTS

Serial No. _____

Section A: Bio data

1. Age: less than 20 ☐ 20-30 ☐ 30-40 ☐ above 40 ☐
2. Residence: _____
3. Religion: Christian ☐ Muslim ☐ Adventist ☐ Others: _____ (specify)
3. Marital status: Married ☐ Single ☐
4. Number of children: ☐
5. Number of pregnancies: ☐
6. Level of education: Never went to school ☐ Primary ☐ Secondary ☐
University ☐ NB: Specify Class please _____
7. Occupation: Housewife ☐ Working ☐ Specify if working _____
8. Apart from pregnancy, did you do a Scan (TV) before? Yes ☐ No ☐

Section B: Knowledge about uses of obstetric ultrasound (TV) tick

9. Do you know ultrasound scan (TV) for pregnancy? Yes ☐ No ☐
10. What do think it can do from these ones?
 - Confirm Pregnancy ☐ - Know month of pregnancy ☐
 - To see the baby ☐ - To see twins in the womb ☐ - See the sex of the baby ☐
 - To see body parts of the baby ☐ - To see position of the baby in the womb ☐
 - To see abnormality in the baby ☐ -To determine expected day of delivery ☐
 - To see the growth of the baby ☐ - To confirm the well-being of the baby ☐
 - To see the umbilical cord and placenta ☐ - To see abnormality in the womb ☐
 - To see if there is bleeding in the womb ☐

11. For this pregnancy did you do a scan? Yes ☐ No ☐

12. From the above what is the major reason you did or want to do scan? (Put a star on it)

13. Where did you learn about the scan (TV)? Friend ☐ Doctor ☐ Nurse ☐

Radio/television ☐ Internet ☐ Others _____ (specify)

Section C: Knowledge about dangers of Ultrasound scan (TV)

14. Would you like to do scan every time you are pregnant? Yes ☐ No ☐

15. Do you think ultrasound scan is safe to the baby?

Don't agree. ☐ Agree ☐ strongly agree ☐ I don't know ☐

If you don't agree, why do you think it is not safe?

16. Do you think ultrasound scan can cause cancer? Yes ☐ No ☐

TO THE RADIOLOGY DEPARTMENT

1. How many ultrasound machines do you have in the department? _____
2. Are they provided by the government or private?

3. If more than one, are they all working? Yes ☐ No ☐
4. Who usually does the scan? _____
5. Who interprets the results? _____
6. Is it for free or the patients have to pay? _____
specify amount if they pay _____
7. When is the scan usually available?

8. How easily can the patients get scanned if they want?

9. Are there other centres that scan in Kiryandongo town apart from the hospital that you know?

APPENDIX 3: APPROVAL LETTER



P O BOX 71, ISHAKA UGANDA
Tel: +256 200923534
www.kiu.ac.ug

OFFICE OF THE DEAN FACULTY OF CLINICAL MEDICINE & DENTISTRY

26/02/2018

TO WHOM IT MAY CONCERN

RE: STEPHEN LORO SIMON (BMS/0031/131/DF)

The above named person is a fifth year student at Kampala International University pursuing a Bachelor of Medicine, Bachelor of Surgery (MBChB) Programme.

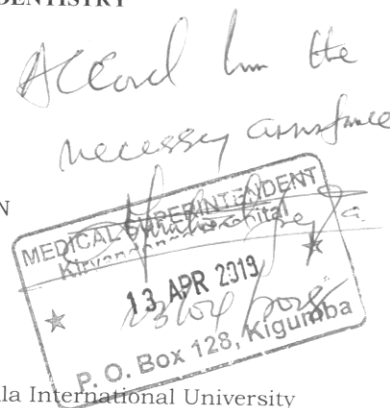
He wishes to conduct his student research in your community.

Topic: Utilization pattern of obstetric ultrasonography among mothers in Kiryandongo Hospital.

Supervisor: Dr. Mulwana Johnnie

Any assistance given will be appreciated.

S.O. Akib
Dr. Akib Surat O
Assoc Dean FCM&D



"Exploring the Heights"

Assoc. Prof Ssebuufu Robinson, Dean (FCM & D) 0772 507248 email: rssebuufu@gmail.com
Dr. Akib Surat Associate Dean FCM & D) email: doctorakib@yahoo.com

APPENDIX 4: WORK PLAN

ACTIVITY	November- December 2017	January 2018	April 2018
• Project Proposal writing.			
• Approval of Project Proposal.			
• Data Collection			
• Data Analysis and submission of the research report			
• Submission of Thesis.			

APPENDIX 5: BUDGET

Item	Quantity	Unit Cost UG sh	Total cost
Pens	5	500	2,500
Internet	3 months	5,000	15,000
Printing the Proposal	4	10,000	40,000
Reports	4	7,000	28,000
Printing Questionnaire	50	200	10,000
Printing Informed consent forms	50	200	10,000
Files	2	2,000	4,000
Binding	4	2,000	8,000
TOTAL			117,500

APPENDIX 6: MAP OF KIRYANDONGO

