

# Routine Application of Ultrasound in Pregnancy Assessing Expectant Mothers' Knowledge, Attitudes and Practices in a Municipal Hospital in Ghana

Gilbertson Allorsey<sup>a</sup>.  
Radiographer/ Health Promotion Specialist  
Sunyani Municipal Hospital,  
Sunyani, Ghana.

Evans Tettey<sup>b</sup>  
Radiographer/ Health Informatician  
Sunyani Regional Hospital  
Sunyani, Ghana

## Abstract

### ➤ *Introduction:*

Prenatal ultrasound screening has become a routine part of care for women in Ghana. The modality is quite different from most other techniques because it permits women to visualize their babies on screen real-time. Routine obstetric ultrasound screening plays a significant role in reducing maternal mortality and has gained recognition for its use in prenatal care globally. The aim of this study centered on describing the knowledge, attitudes, and practices of pregnant women towards prenatal sonography at a Municipal Hospital in Ghana.

### ➤ *Methods:*

A non- intervention descriptive cross-sectional study using interviewer-administered questionnaire was employed. The data was analyzed by using Epi-info. The data analyzed was presented in tables and charts.

### ➤ *Results:*

Three main variables were measured in this study. They were Knowledge, Attitude, and Practices. Women's knowledge, attitude, and practices of routine prenatal ultrasound screening were influenced mainly by their biosocial factors like gravidity, parity, education level, and occupation. Overall, women were not fully informed about the limitations and effects of testing to facilitate an informed choice. 270 (25.96%) of the women articulated concern that obstetric sonography has the tendency of causing cancer as a result of over-exposure.

### ➤ *Conclusion:*

Obstetric sonography is exceedingly prized as being dynamic for antenatal care. However, its beneficiaries and health care providers need to be well informed about the safety, specific purposes and limitations of prenatal ultrasound screening.

**Keywords:-** Knowledge, Attitudes, Practices, Prenatal Ultrasound.

## I. INTRODUCTION

Pregnancy has increasingly been medicalized globally, especially for obstetrical care, due to advances in healthcare technology<sup>1</sup>. The exertion of control of this perception is ingrained in a number of developments lengthening over a period of time. For such developments, it has been recognized that the decline in maternal and perinatal morbidity and mortality are valid reasons for all the modifications made in current health service delivery particularly for the antenatal and postnatal care<sup>2</sup>. The routine application of ultrasound in obstetrical care has been one of the most vital developments in antenatal care across the world<sup>3</sup>.

Some studies however report the predicaments to be encountered by health workers and their clients with respect to the advances in medical technologies<sup>3</sup>. Technologies like sonography have the likelihood to raise economic, social and ethical problems for both health service professionals and beneficiaries of the health service delivery<sup>3</sup>.

Although obstetric sonography has been recognized for its beneficial role in antenatal care, it's regular use in medical practice remains debatable<sup>4</sup>. Most studies on the use of ultrasound in pregnancy note the psychosocial and therapeutic benefits of prenatal sonography. Among these benefits of the ultrasound screening experience are the reassurance of both pregnant women and their families about the well-being of the fetuses; an empowering approach for women to take control of their health and restrain themselves from practices that are harmful to the health of the foetuses; and to accelerate early bonding and a pleasurable pregnancy experience<sup>5</sup>. On the contrary, some studies claim that pregnant women on some occasions are of unbeatable anticipations during scanning. The failure to meet such expectations creates a different feeling, thus leading to disappointments for them after the scan<sup>6</sup>. The experience for women with higher levels of education may differ from that of women with lower levels of education. The former are likely to be more expectant and have the urge to know more about their pregnancy during scanning than the latter<sup>7</sup>.

Studies show that in recent times, obstetric ultrasound screening has been noted as a central part of antenatal care and health professional have therefore recommended its integration in health service delivery<sup>3</sup>. This notwithstanding, health professionals have become overly reliant on the use of the technology to an extent that requisitions for scanning are made without any proper justification of the examinations and also largely because of its over-commercialization for financial gains in both public and private health facilities.

In Ghana, although efforts are being made to increase public awareness on issues related to antenatal care and safe motherhood, there seem to be limited understanding on the use of ultrasound scans in pregnancy. Factors responsible for this situation are low literacy rate and the socio-cultural environment where for instance women are not allowed to seek education and are only privileged to visit the hospital on authority of their male counterparts.

Many pregnant women who attend antenatal clinics in Ghana are offered ultrasonography early in pregnancy to detect the viability of the fetus, multiple pregnancies, gestational age, and the locality of the placenta. Few hospitals and diagnostic centers offer ultrasonography to detect anomalies of the fetus, including chromosomal abnormalities. This study is therefore set out to assess the women's knowledge, attitude, and practices concerning ultrasonography in pregnancy.

A study in Northern Tanzania established that majority of women desire ultrasonography, however many do not understand the procedure or purpose<sup>8</sup>. Pregnant women's expectations include determining the fetal position, fetal sex, and pregnancy anomalies. However, women commonly over-estimated the dimensions of ultrasound screening and had significant fears of harm<sup>8</sup>.

In a similar study in North- Central Nigeria, it was reported that the use of ultrasound as a standard tool for obstetric care is faced with barriers hindering its utilization in prenatal care<sup>9</sup>.

Whiles a large number of pregnant women in Ghana have sonograms at some point during pregnancy; the utility of prenatal sonography is still debatable. Some researchers are of the opinion that screening sonography is cost-effective during pregnancy<sup>10</sup>, while others are thinking in tandem with the former and argue for its routine use during pregnancy<sup>11</sup>. Others are of the opinion that it increases the cost of prenatal care<sup>12</sup>, does not lead to improvement in perinatal outcome<sup>13</sup>, and offers little benefit in low-risk patients<sup>14</sup>.

The study is to investigate the knowledge level, attitude and practices of pregnant women on routine prenatal ultrasound screening and especially how it enhances the improvement of maternal health (MDG 5).

The results of this study may help individuals and health service organizations who are committed to improving maternal health to:

- Nurture and maintain a highly skilled health workforce;
- Produce behavioural changes leading to improvements in maternal health; and
- Improve the health of the general populace.

## II. MATERIALS AND METHODS

The study was conducted at a Municipal Hospital in the Brong Ahafo Region- Ghana. The study design was based on a non-intervention descriptive cross-sectional study. The study population consisted of all pregnant women who visited the Hospital for antenatal, maternity and ultrasound services. A non-probability sampling method of the purposive type was used to select 1040 pregnant women who were willing to participate in the study. Respondents who met the desired characteristics, that is, a pregnant woman of any age group, gestational age and without pregnancy complications were administered with questionnaires. Primigravida and multiparous women were all included in the study sample in order to obtain the feelings and attitudes of both groups. Women with pregnancy complications were however restricted to participate in the study as the pregnancy experience may be exceptional in their case.

The variables under study were maternal age, marital status, education and occupation, religion, gravidity and parity as socio-demographic variables; and the knowledge, attitudes, and practices of expectant mothers as the dependent variables.

The use of an interviewer-administered questionnaire was employed in the collection of data from the respondents. The questionnaire was made up of three parts. The first part contained questions, which sought the demographic information of the respondents. The second part was meant to assess the knowledge level of expectant women on prenatal ultrasound screening and the third part sought information on the attitudes and practices of pregnant women towards prenatal ultrasound screening.

Pre-testing of the questionnaire was carried out by administering the questionnaire to five pregnant women who were randomly selected with criteria similar to those stated for the sample population outside the study area.

The data was analyzed by using Epi-info. The data analyzed was presented in tables and charts.

Ethical approval was obtained from the Regional Health Directorate and the authorities of the Municipal Hospital. The informed consent of each study participant was also obtained. Confidentiality, autonomy, respect, and dignity of all the participants were strictly observed throughout the study. Additionally, the study participants were made certain of their rights to decline to participate in the study and also not to answer questions they felt

uncomfortable with. The participants were also assured that there will be no harm, partiality, malevolence or any form

of danger should they wish not to participate in or drop out of the study.

### III. RESULTS

Variable name	N= 1040
Maternal Age (years) mean (sd)	1040 (9.92)
Marital status n (%)	Married= 728 (70) Single= 312 (30)
Religion n (%)	Christian = 665 (63.94) Moslem = 312 (30) traditional = 62 (5.96) No response= 1(0.09)
Education	Primary= 270 (25.96) Secondary= 457(43.94) Tertiary= 104 (10) None= 208 (20) No response= 1(0.09)
Occupation n (%)	Artisan= 20 (1.92) Farmer= 249 (23.94) Trader= 395(37.98) Public servant= 189 (18.17) Civil servant= 104 (10) None= 83 (7.98)
Gravidity n (%)	One = 187 (17.98) Two = 291(27.98) Three= 458 (44.04) Four or more= 104 (10)
Parity n (%)	None= 64 (6.15) One = 104 (10) Two = 166 (15.96) Three= 374 (35.96) Four or more= 332 (31.92)
Gestational age n (%)	First= 146 (14.04) Second= 686 (65.96) Third= 208 (20)

Table 1:- Description of Sample

A total of 1040 pregnant women aged 16 to 45 years participated in this study. The response rate was 100%. Table 1 describes the characteristics of the sample population. The mean age of the sample population was 29.26, SD = 9.92. Majority (728, 70%) of the women were married, 665 (63.95%) were Christians and 457 (43.95%) had secondary school education. Most 395 (37.98%) of the respondents were traders. Gravida 3 women 458 (44.04%) formed the largest proportion of the respondents. Also, most 374 (35.96%) of the respondents were para 3. Larger proportions 686 (65.96%) of the respondents were in their second trimester at the time of the study.

#### ➤ Knowledge of Pregnant Women on Routine Prenatal Ultrasound Screening

Figure 1, tables 2 and 3 show the respondents' knowledge of prenatal ultrasound screening. Majority of the respondents, thus, 957 (92.02%) reported having knowledge about prenatal ultrasound screening. 83(7.98%) said they had no knowledge about it. In relation to this,

most (72.02%) said they acquired their knowledge of prenatal ultrasound scanning from family and friends, with the least number of respondents (2.02%) obtaining their knowledge from books.

All pregnant women were able to indicate a reason for prenatal ultrasound screening. 100% of the indicated the determination of fetal sex as a reason, whereas more than half of them mentioned the determination number of fetuses, fetal position/ lie, viability, gestational age, fetal abnormalities and expected date of delivery.

More than half (74%) of the women interviewed were of the view that ultrasound had adverse effects on pregnancy. The adverse effects as mentioned by the respondents are cancer, fetal demise, fetal anomalies, and burns. 26% of the women mentioned that ultrasound presented no adverse effects on the pregnancy.

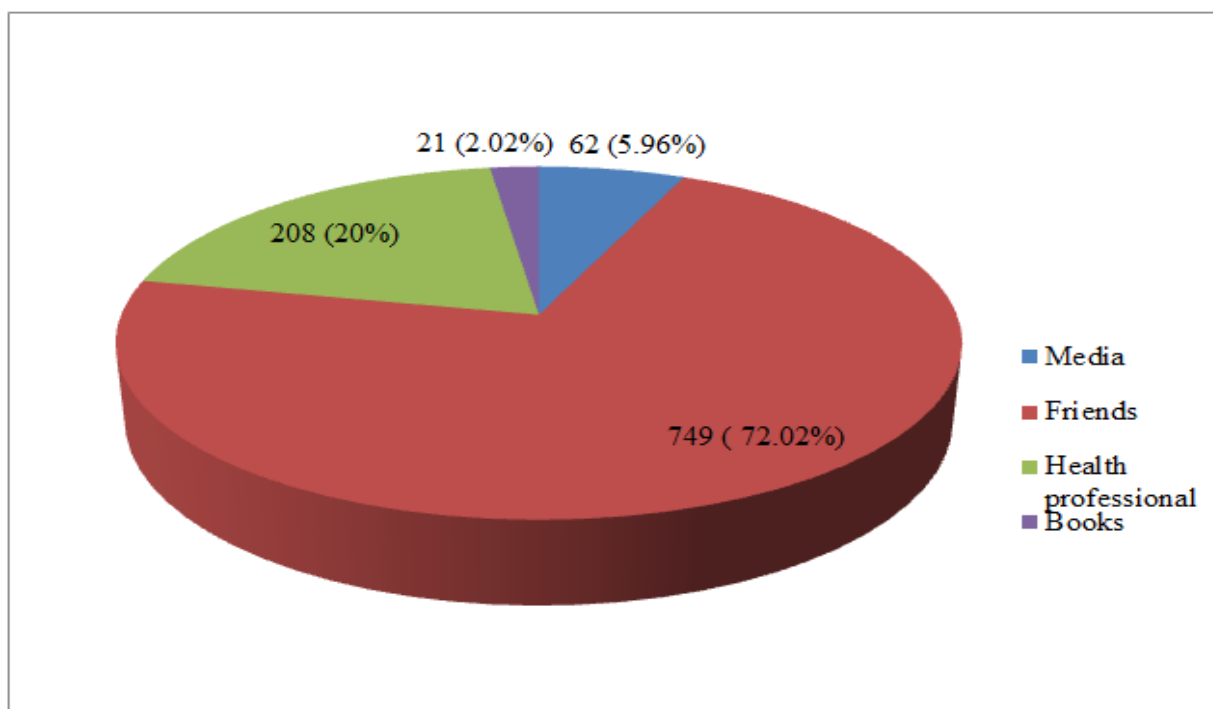


Fig 1:- Sources of Knowledge on Prenatal Ultrasound Screening.

INDICATIONS	NUMBER OF RESPONDENTS	PERCENTAGE(%)
To check for number of fetuses	978	94.04
To check for fetal position/ lie	811	77.98
To check for viability	749	72.02
To date the pregnancy	936	90
To check for placental site	790	75.96
To assess liquor volume	603	57.98
To check for fetal abnormalities	624	60
To check for the sex of the fetus	1040	100

Table 2:- Indications of Prenatal Ultrasound

EFFECTS	NUMBER OF RESPONDENTS	PERCENTAGE (%)
Cancer	270	25.96
Fetal Demise	104	10
Fetal anomalies	146	14.04
Burns	62	5.96
Don't know	187	17.98
No effect	271	26.06
<b>TOTAL</b>	<b>1040</b>	<b>100</b>

Table 3:- Respondents' knowledge on Effects of Prenatal Ultrasound

➤ *Attitudes and Practices of Pregnant Women on Routine Prenatal Ultrasound Screening*

The results of the study indicated that pregnant women's attitude and practices toward routine prenatal ultrasound screening are influenced by education and occupation. Majority of the pregnant women who reported a positive attitude towards obstetric ultrasound screening had secondary education and were employed; with majority 811(77.98%) mentioning that they had a choice in undergoing ultrasound examination and 229 (22.02%) saying they had no choice. Further, 416 (40%) of the women reported having requested for the ultrasound examination

themselves whiles 624(60%) said the examination was requested by the health professionals.

915(87.98%) of the women expressed their views that all pregnant women should undergo ultrasound screening, reason being for the effective and proper management of pregnancy and its complications; whiles 125(12.02%) of the respondents who alternatively disagreed stated that expectant mothers without complications should not undergo ultrasound screening in order to reduce client waiting time and save cost.

#### IV. DISCUSSION

##### ➤ *Knowledge of Pregnant Women on Prenatal Ultrasound Screening.*

The study revealed that majority of the study participants claimed to have knowledge about prenatal ultrasound screening. This is may be attributed to the proliferation and extensive sonography practice in health service over-time and as part of routine antenatal care as well as the infinite access to information on ultrasound application in pregnancy. However, most of the participants claimed they acquired their knowledge from family and friends. This finding is in contrast to a study conducted by Enakpene et al., where they reported that pregnant women acquired their knowledge of prenatal ultrasound screening from the health professionals during antenatal visits<sup>7</sup>. This finding has an implication that pregnant women feel more comfortable discussing issues concerning pregnancy with their families and friends rather than their health professionals.

This notwithstanding, the knowledge of the women on the application of ultrasound in pregnancy varies mainly with respect to their educational levels. The level of education bares an influential effect on the women's approach to acquiring and synthesizing information about the use of ultrasound in pregnancy<sup>7</sup>. Women with lower levels of formal education tend to be limited in knowledge about prenatal ultrasound screening because they mostly acquire information from their peers only. This study revealed that such women think that the ultrasound scan is to only check for viability and sex, aside the numerous benefits of ultrasound usage in pregnancy.

On the contrary, women with higher levels of formal education had different information sources like books, journal articles, newspapers, radio programs. The reason for this assertion is that, being literate, the women are able to read, listen and understand information. Therefore these women have the ability to cite very many other relevant indications for obstetric ultrasound scans. This, therefore, shows the significance of formal education in society as it equips people with skills to access reliable information.

The study, however, revealed some misconceptions about the use of ultrasound in routine prenatal care and as a result, some of the participants expressed fear during ultrasound examinations. Some of the study participants indicated that routine ultrasound screening could lead to cancer, burns, fetal demise, and fetal anomalies. This misleading information may have been as a result of knowledge acquisition from family and friends rather than from well-trained health professionals with the requisite skills and knowledge about prenatal ultrasound screening. Conversely, another study indicated that women in the developed world uncritically seek ultrasound scan services scan without any of the fear or ulterior motive<sup>15</sup>.

##### ➤ *Attitudes and Practices of Pregnant Women towards Prenatal Ultrasound Screening.*

Generally, the study showed that pregnant women exhibited a positive attitude towards obstetric sonography although some expressed feelings of fear in undertaking the examination. All women in this study reported accepting to undergo an ultrasound examination as requested by their Physicians and Mid-wives. The compliance of women to accept an ultrasound scan examination may be explained by the perceived benefits of undertaking the examination. Studies have noted that women's anticipated excitement of visualizing their babies on screen contributed to their positive attitude towards prenatal ultrasound screening<sup>2</sup>. Gross fetal movement; determination of the fetal sex; the expected date of delivery; and the general well-being of the fetuses have an essential influence on the women's perception of obstetric sonography<sup>8</sup>. The women are able to visualize the progress of their babies, thereby, creating an early fetal-maternal bonding prior to delivery.

The urge to undertake an obstetric ultrasound scan is also influenced by gravidity and parity as this study has shown. Primi-gravid and multi-gravid nulliparous women were more likely to seek prenatal ultrasound services simply to know the well-being and determine the sex of the fetus as opposed to multiparous women. This is as a result of the pleasurable effect first time expectant mothers feel, and in preparation for the arrival of the baby beforehand; an experience that heightens hopes and expectations in primi-gravid women<sup>7</sup>.

However, the disclosure of fetal sex to the pregnant women warrants careful consideration as this raises numerous ethical, legitimate and social impasses, and can have an effect on maternal-fetal bonding. Some studies have also warned about the ethical and social implications of disclosing the fetal sex to pregnant women<sup>16</sup> and also caution about the misuse of ultrasound in pregnancy especially where some pregnant women make self-requests for the examination without any valid indication for it just because they can afford it<sup>4</sup>.

Limitations to this study were that only one hospital in the Brong Ahafo Region of Ghana was chosen for this work, therefore the results may not generalizable to represent the entire nation. The study also required some level of intellectual ability from respondents, making some of them unwilling to participate. Despite these challenges encountered, this study is still very valuable as basic research that could be of immense contribution to improving maternal health in Ghana.

#### V. CONCLUSION

Prenatal ultrasound screening has been embraced as being an essential fragment of obstetric care. Most women want to experience it during the pregnancy period and seek for it with or without a health service providers' prescription. However, the use of ultrasound in pregnancy need to be guided and underpinned by justified reasons in relation to other activities of the prenatal health care

package and not just over-commercializing it. The perception of women that the excessive exposure to sonography can lead to cancer, burns, fetal anomalies, and demise warrant attention. There is a need for extensive public education to demystify the perception and inform the populace about the limitations of sonography in pregnancy.

➤ *Conflict of Interest Statement*  
None.

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