

Original Research

Knowledge and attitude regarding obstetric ultrasound among pregnant women in India: A cross sectional study

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ABSTRACT:

Background: Ultrasound technique is applied all across the world as an essential component of Obstetric examination. However, it is sometimes misunderstood as a screening and diagnostic tool by women. **Aim:** The aim of this study was to assess knowledge and attitude regarding ultrasound among pregnant women. **Materials and methods:** This was a cross-sectional and prospective study questionnaire based study that was conducted following Institutional Ethical Committee approval. Consecutive sampling method was used for recruitment of 300 pregnant females in this study. Inclusion criteria of study were: a) Pregnant women willing to participate in this study, 2) Pregnant females at low health risk and 3) Those who were pregnant for first time. Exclusion study criteria were a) Pregnant women not willing for participation, b) Ladies who had multiple pregnancies and c) Those with any systemic diseases. Obtained data was analyzed using SPSS software (Statistical Package for Social Sciences), (v. 20.0; SPSS Inc., US). Descriptive statistics was used for analysis of socio-demographics related data. Categorical variables evaluation was done by 'Chi-square' test. P values lower than 0.05 was set as statistically significant. **Results:** In the studied sample, study participants were found to have good knowledge and positive attitude towards the use of ultrasound in pregnant women. **Conclusion:** In present study, majority of studied sample comprising of expectant mothers were shown to have good knowledge of ultrasound in pregnancy and had positive attitude towards its use during pregnancy.

Keywords: Knowledge, attitude, obstetrics, prospective, questionnaire

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INTRODUCTION

Ultrasound imaging technique is a non-invasive, cheap as well as safe tool for the assessment of pregnancy status. It provides real-time pictures of fetus and is an accepted practice in obstetrics all across the globe. ^[1] Use of ultrasound in obstetric evaluation of pregnant females has been reported to improve the efficiency of management of pregnancy successfully. ^[2] Obstetric ultrasonographic imaging is an important tool for determination of pregnancy, location of embryo, viability of embryo, estimation of pregnancy period, estimation of delivery date, evaluation of fetal position, localization of placenta; assessment of amniotic fluid along with assessment of anatomy of fetus. ^[3] The socio-economic status along

with level of education influences the perception of any woman towards use of obstetric ultrasonography in terms of their knowledge and attitude towards this technique during pregnancy. ^[3] The level of knowledge and attitude of pregnant females towards the use of ultrasound technique in obstetrics has been studied all across the world. There are studies that have shown good level of knowledge in pregnant females in terms of ultrasound imaging during pregnancy. ^[4,5,6,7] This may be attributed to usage of ultrasound images in obstetric care as a routinely followed procedure in ante-natal care and wide accessibility to variety of available information. ^[8] Few of these studies have demonstrated 100% response rate. Most study participants were in 21 to

30 years of age range whereas few were above 41 years. [48] Several studies have shown that pregnant female patients had awareness regarding the use of ultrasound for various diagnostic purposes that included assessment of gestation age, estimation of delivery date, diagnosing any developmental abnormalities, monitoring baby's growth, determining gender of the foetus, detection of anomalies, confirmation of pregnancy or detection of more than one pregnancy. [9] The main sources of information to the pregnant women regarding obstetric ultrasound imaging include health care workers, family members, and their friends along with audiovisual media. [10] Information provided by the doctor's help in avoidance of misconceptions lacking any scientific basis and may represent a general view-point. Most of the pregnant ladies consider use of antenatal ultrasonography as safe procedure. [11]

Although, there are few women who raise doubts about the safety of this technique during pregnancy. [2] These females are usually of opinion that exposure to multiple ultrasound scanning might be harmful to a foetus, may result in development of cancer and cause significant impairment among mothers as well as to foetal health. [10] Hence, in such individuals there is a need of providing appropriate health associated education involving the safety profile of ultrasound imaging during pregnancy. As per the World Health Organization, it has been recommended that obstetric ultrasonography must be done at every antenatal appointment. [12] Hence, after considering these findings, this study was done with an aim of assessing the knowledge as well as the attitude regarding obstetric ultrasound among pregnant women.

MATERIALS AND METHODS

Study design and setting: This cross-sectional, prospective study was performed in Obstetrics Out patient department after obtaining approval from Institutional Ethical Committee. The purpose of the study was explained to the study participants in their native local language and signed informed consent was obtained from them before commencing with the study protocol. All selected participants were provided with a questionnaire that involved responses on their level of knowledge and their attitude regarding use of ultrasound as obstetric examination during pregnancy.

Study participants and sampling method: Consecutive technique of sampling was employed for recruiting 300 pregnant female participants in this questionnaire based study. This allowed investigators recruitment of study participants who reported for medical evaluation. It was an easy, had convenience and consumed less amount of time. Inclusion criteria: 1) Pregnant females who were willing to participate in the study, 2) Pregnant women at low risk and 3) Women pregnant for first time. Exclusion criteria: 1)

Pregnant women not willing to participate in the study; 2) women with multiple pregnancies and 3) Women with known systemic conditions. The study questionnaire comprised of 3 segments: a) First segment of the questionnaire evaluated socio-demographic characteristics of participant subjects that included mother's age, age at time of gestation, level of education of both the pregnant female and spouse, monthly income of the family, type of occupation, any visits to obstetricians previously, number of gravidity as well as parity and awareness regarding perinatal health. Second part of questionnaire contained thirteen questions which evaluated knowledge level of patients on usage of ultrasound technique in pregnancy. Its contents were focused upon outcome of ultrasound during pregnancy, detection of fetal abnormalities, limitations associated with ultrasound, period of gestation of ultrasound and safety associated with ultrasound. Study participants were given 1 point for each of the correct answer when total accumulated score was categorized into three a) 0 to 4: Insufficient, b) Moderately sufficient score: 5 to 8 and c) Sufficient: 9 to 13. Third segment of the study questionnaire evaluated the attitude of pregnant females before performing the ultrasound. This part of questionnaire contained questions on a) detection of abnormalities using ultrasound during pregnancy; b) numbers of scans conducted during pregnancy and c) queries regarding identity of person performing ultra-sonography. Statistical analysis: Collected data was recorded and then analyzed by SPSS software (Statistical Package for Social Sciences), (v. 20.0; SPSS Inc., Chicago, US) for Windows. Descriptive statistics were used for analyzing socio-demographic data. Categorical variables were evaluated by using Chi-square statistical tool. P values which were lesser than 0.05 was considered with statistical significance.

RESULTS AND OBSERVATIONS

a) Demographic characteristics: On analyzing the age distribution, it was found that maximum number of pregnant women in the studied sample was between 21 to 30 years age while 25 % fell between 31 to 40 years and 24 % were in between 18 to 20 years age group. Only 12 % of pregnant women were above 40 years of age (table 1). b) Distribution of studied subjects as per level of education: On analysis of education level, it was found that 27 % of pregnant women were post-graduate, 13 % had received graduation, 23% studied till higher secondary level, 14 % of pregnant women had receive education till primary school while 22 % received no education (table 2) Of the studied population sample, 38 % of patients were in third trimester of pregnancy, 37 % were of third trimester while 25 % had second trimester pregnancy (table 3). b) Knowledge level of pregnant women in the study: On analysis of knowledge on use of ultrasound that ultrasound was an important examination which is required during

pregnancy, 13% disagreed over use of ultrasound in pregnancy, 32 % were neutral regarding use of ultrasound examination during pregnancy while 0.05 % of pregnant females had no knowledge regarding use of ultrasound examination during pregnancy. 69 % of pregnant study participants believed that ultrasound was not harmful to foetus, 23 % believed ultrasound examination is a harmful during pregnancy, 5 % were of mixed opinion, 3 % had no knowledge regarding any effects of ultrasound on a foetus (Table 4 and Graph 1). 89 % pregnant women agreed that ultrasonographic examination is an useful tool for determining the health of the foetus, 1 % disagreed that ultrasound was of any use concerning the health of a baby, 9 % were neutral in their opinion while 1 % of studied pregnant women had no knowledge regarding usefulness or harmful nature of ultrasound examination (Table 4 and Graph 1). 90 % of pregnant study subjects believed that ultrasonography can estimate delivery date, 2 % disagreed on its utility, 6 % had neutral opinion and 2 % had no opinion regarding this (Table 4 and Graph 1). 79 % of assessed female pregnant subjects agreed that ultrasound examination can detect any abnormalities in developing foetus, 11% disagreed upon utility of

ultrasound imaging technique in detection of abnormalities while 6 % and 4 % of studied pregnant female population had no knowledge concerning this aspect (Table 4 and Graph 1).

All parameters which were analyzed for assessment of level of knowledge were found to be statistically significant (Table 4 and Graph 1).c) Attitude in pregnant female subjects regarding ultrasound use: On assessment of attitudes in pregnant women, it was noted that 76 % of patients had queries regarding the individual who was conducting the ultrasound examination, 14 % had concerns regarding appropriateness of ultrasound according to their religion, 89 % had expectations concerning with satisfaction level associated with ultrasound procedure, 15 % had negative attitude regarding the safety concern of fetal health under ultrasound examination, 2 % demonstrated negative attitude regarding cancer causing potential of ultrasound test, 56 % had positive attitude regarding lack of any ill effects of ultrasound procedure during pregnancy. 67 % of study participants had an upright attitude regarding its cheap pricing while 12 % felt that it was an expensive yet was within the process that one could afford. 21 % of studied population felt that ultrasound was unaffordable (table 5 and Graph 2).

Table 1: Subjects distribution as per age

Age (in years)	Percentage (%)
18 to 20 years	24 %
21-30 years	39 %
31- 40 years	25 %
>40 years	12 %

Table 2: Subject distribution according to level of education

Level of education	Percentages (%)
Primary level	14 %
Higher secondary level	23 %
Graduation	13 %
Post-Graduation	27 %
No education	22 %

Table 3: Table illustrating patient distribution during ultrasound examination

Trimester	Percentages (%)
First trimester	37 %
Second trimester	25 %
Third trimester	38 %

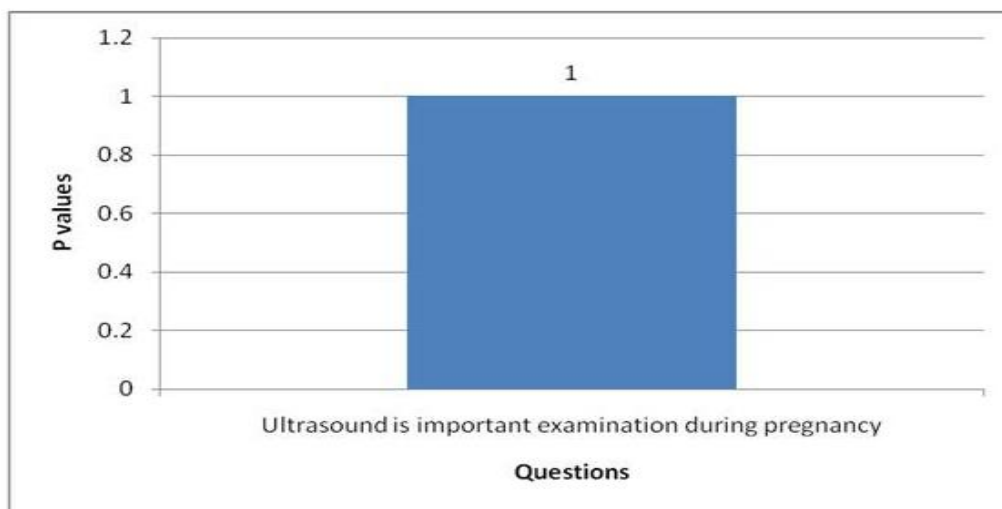
Table 4: Assessment of level of knowledge in study participants regarding use of ultrasound during pregnancy

Questions	Agree (%)	Disagree (%)	Neutral (%)	Do not know (%)	P values
Ultrasound is important examination during pregnancy	45 %	13 %	32 %	02 %	0.05
Ultrasound can be harmful to the baby	23 %	69 %	05 %	03 %	0.04
Ultrasound is useful in finding out about the health of the baby	89 %	01 %	09%	01 %	0.03
Ultrasound scan can help in estimating delivery date	90 %	02 %	06 %	02 %	0.03

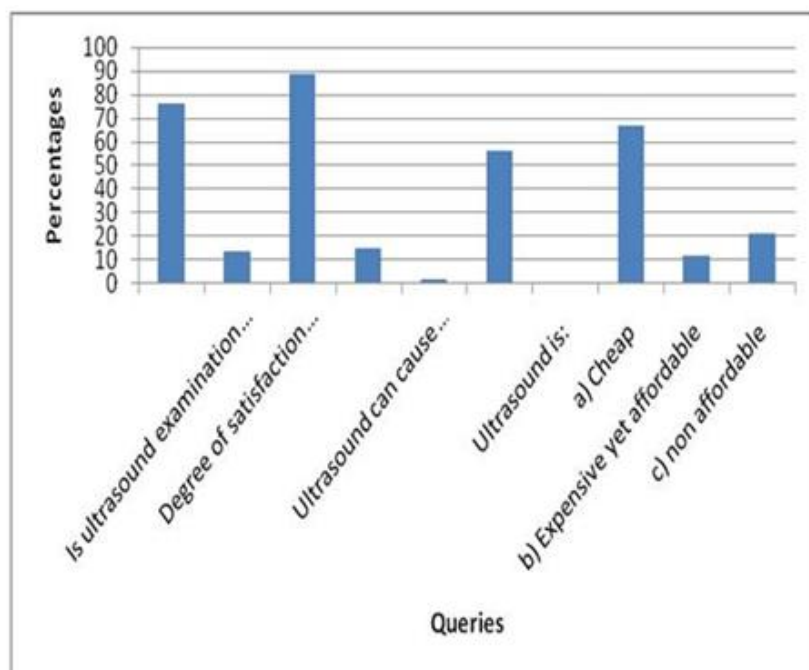
Ultrasound can detect abnormalities in a baby	79 %	11 %	06 %	04 %	0.05
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Table 5: Table showing attitude of studied pregnant women towards use of ultrasound

Questions	Percentage
Queries about person performing the ultrasound examination	76 %
Is ultrasound examination allowed in one's religion	14 %
Degree of satisfaction with ultrasound procedure	89 %
Ultrasound scans can affect the health of the baby	15 %
Ultrasound can cause cancer	02 %
There is no ill effect of undergoing ultrasound imaging	56 %
Ultrasound is:	
a) Cheap	67 %
b) Expensive yet affordable	12 %
c) non affordable	21 %



Graph 1: Graph showing P values of various parameters studied for assessing knowledge of pregnant women



Graph 2: Graph depicting percentages of responsiveness for the assessment of patient attitude

DISCUSSION

Ultrasonography is considered the most popular modality for conducting imaging during pregnancy in obstetrics.^[13]

Pre-natal diagnostics has significantly improved the timely detection as well as management of congenital anomalies. It has diagnostic utility in a variety of conditions like obstruction in labor, non-cephalic position of foetus, number of pregnancies, incomplete miscarriages, molar or ectopic pregnancy, abnormalities in foetus, intra-uterine restriction in fetal growth, placenta previa, measurement of pelvic outlet and estimating gestation age.^[14] Ultrasonography is a clinician dependent skill which involves high technicality. Thus, makes rigorous training a necessary requirement for ensuring highest quality health services.^[15] Kasap et al (2016) in their study reported that the mean \pm S.D. age (in years) of pregnant women was 28.6 \pm 4.9 years (i.e., 18 to 39 years). Level of knowledge was observed to be insufficient in 31.4 % women, moderate sufficient in 51.9 % pregnant women and of sufficient level in 16.7 % of study respondents.^[16] Similarly, Dasan et al (2016) in their study on the knowledge and attitude of pregnant women on antenatal ultrasound examination revealed only 30 % to 40 % knowledge regarding importance of ultrasound during pregnancy.^[17] Also, Haile et al (2023) in their study on Ethiopian origin pregnant females reported that proportion of females with good level of knowledge involving obstetric ultrasonographic examination was 51.4 % while it was found that positive attitude towards ultrasound was 70.1 %.^[18] In contrasting observations, Maniragena et al (2021) reported good knowledge of use of ultrasound examination in their studied Ugandan population. However, there was found to be poor attitude towards this diagnostic modality.^[19] In similar findings, Gebremariam et al (2019) reported good knowledge as well as attitude towards ante-natal ultrasonographic examination in Eritrea. Although, its practice was found to be below (45 % of study participants).^[20] In current study, majority of patients demonstrated statistically significant knowledge levels regarding ultrasound imaging during pregnancy (table 4). This is in conformance with observations reported by Maniragena (2021) and Gebremariam (2019). Also, positive attitude was obtained on analyzing various parameters of the study. This finding has been supported by Gebremariam et al (2019).^[19] Hence, Obstetric ultrasonography is an important technical advancement during surveillance of pregnancy and forms important component of ante-natal care.^[21]

CONCLUSION

Ultrasound examination is a standard modality for fetal examination during ante-natal check-up. It has multiple uses including determining age of the foetus, developmental anomalies, date of delivering the child, any physical defects in ovaries or uterus etc. There

are contrasting studies which deal with the knowledge of ultrasound, attitudes of pregnant women or acceptance of this technique during monitoring one's pregnancy. In present study, studied subjects demonstrated high level of knowledge and acceptance for the use of ultrasound in antenatal checkup appointments.

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