

Knowledge and Attitude of Pregnant Women 15-49 Years Old About Ultrasound Examinations: A Cross Sectional Study

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ABSTRACT

Introduction: Ultrasound is commonly used in determining the gestational age due to its non-invasive nature and availability. On the other hand, limited health literacy is a common problem in pregnant women visiting healthcare facilities. Considering the importance of maternal and fetal health during pregnancy, the aim of this study was to assess the knowledge and attitude of pregnant women about ultrasound examination and its risks.

Material and Methods: This research was a descriptive-analytic study in which 231 pregnant women referred to health centers in 2017 were selected according to inclusion and exclusion criteria. Inclusion criteria were the willingness to participate in the research, having literacy, the age of 15 years to 49 years, and exclusion criteria were having severe emergency conditions, pain, and discomfort when completing the questionnaire, and reluctance to participate in the study.

Results: In this research, the age of pregnant mothers ranged from 15 years to 49 years with the mean of 28.31 years \pm 5.55 years. The results of the study showed that 35.10% of women experienced their first pregnancy, and for 0.4%, it was their seventh. The results demonstrated that the mean score of knowledge was significant in terms of education ($p=0.00$), husband's education ($p=0.01$), and age ($p=0.01$), but there was no significant relationship with attitude. Also, the mean attitude score in terms of the number of deceased children was significant ($p=0.02$). Findings indicated that there is no significant relationship between the month of pregnancy, the number of pregnancies, occupation, and number of children with knowledge and attitude ($p>0.05$).

Conclusion: In this study, most women had a negative attitude towards ultrasound, which may be due to the lack of awareness about this subject. This may reflect the inadequacy of the training required by health authorities.

Because low health literacy can prevent the proper understanding of health messages and recommendations, it is essential that health workers use effective methods of transferring information to these individuals.

Key words: Women, Ultrasonography, Pregnancy, Iran

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INTRODUCTION

Ultrasonography as one of the diagnostic radiology methods has good acceptance in patients [1]. It is commonly used in determining the gestational age, femur length, abdominal circumference, head circumference, transverse length of the cerebellum, and many other anatomical measurements of the fetus [2]. Today, three

and four-dimensional ultrasonography is the most important tool for evaluating embryonic anomalies [3]. Although epidemiological studies have failed to show the damaging effects of ultrasound in humans [4] as a form of energy, the ultrasound has the potential to produce certain biological effects [5]. The mechanisms by which ultrasound can affect tissues can be generally classified into two broad categories of thermal and non-thermal. Acoustic effects causing biological effects without high temperatures are known as non-thermal mechanisms. The results obtained by non-thermal mechanisms are usually called "mechanical effects" which do not usually change

the fetus because they are caused by very fine air bubbles not present in embryonic tissues. Sound effects influencing the tissues by overheating them above the normal physiological temperatures are known as thermal mechanisms. Heat can alter tissues in different ways. For example, the rapid increase in heat generated by the ultrasound centralized with high intensity can easily eliminate anything in its focus. At lower intensities, ultrasound absorption may induce hyperthermia in that position. Such heat can damage biological systems through other ways, for example, by increasing metabolism and tissue perfusion. Hyperthermia is also involved in other harmful effects, especially in tissues with low perfusion [6]. Therefore, the use of midwifery ultrasonography is only ethically justifiable when applied on the basis of medical evidence [7]. Non-medical use of ultrasonography in pregnancy involves viewing the fetus, having a picture of the fetus, determining the sex, or ensuring the health of the fetus [8]. Ugwu *et al.* have reported that only 69 (46%) women asked for ultrasonography without prescription, while 54 (36%) visited their doctors for ultrasonography and only 4 (2.7%) believed that an infection could occur during pregnancy ultrasound. In this study, it was also reported that, out of 150 responders, the results of prenatal ultrasound were considered reliable by 95 (62.2%). In addition, results showed that women seek prenatal ultrasound by themselves and without referral to a doctor [9]. This study was consistent with the study by Stephens *et al.* reporting that many women were willing to perform the ultrasound and pay for it, even when they became accustomed to free health care [10].

Limited health literacy is a common problem in pregnant women visiting healthcare facilities. Because low health literacy can prevent proper understanding of health messages and recommendations, it is essential that health workers employ effective methods for transferring information to these individuals [11]. Since mothers have the most contact with infants, high maternal awareness of care and neonatal risk factors can be very effective in preventing neonatal mortality. Mothers' lack of awareness of neonatal care can lead to their inadequate functioning during this period and, as a result, to various illnesses and even fetal mortality. Therefore, mothers' awareness of neonatal care is of considerable importance in national health development [12]. Despite the efforts of healthcare staff and health houses to raise the level of knowledge, attitude, and practice of mothers in the field of maternal and neonatal care, it seems that information on this topic is limited. Therefore, comprehensive and extensive effort for informing mothers is essential to prevent the occurrence of rebound physical and mental retardation of their children and other consequences. Considering the importance of maternal and fetal health during pregnancy, and also because no similar study had been conducted in Iran, the aim of this study was to determine the knowledge and attitude of pregnant women about performing ultrasonography examination and its risks.

MATERIALS AND METHODS

In this descriptive-analytic study, 231 pregnant women referred to the health centers in 2017 were selected based on inclusion and exclusion criteria. Sample size was calculated based on previous researches and PASS software. By using of standard deviation 2.6, the first type error of 0.05 and sampling error of 0.4, samples size was calculated. Inclusion criteria were the willingness to participate in the research, literacy, and age of 15-49 years, whereas exclusion criteria were severe emergency conditions, having pain and discomfort when completing the questionnaire, and unwillingness to cooperate. Using the cluster sampling method, the city of Khorramabad was first divided into five geographical regions. Then, in each region, two centers were selected as cluster heads according to the volume of visitors from each sample center using the systematic random method. Next, according to the inclusion and exclusion criteria, the sample was selected from among pregnant women referred to the noted centers using the convenience method. The data collection tools were two questionnaires. The first part of the researcher-made questionnaire included demographic information (age, marital status, educational level, occupation, income, number of ultrasound examinations, type of ultrasound examination, gestational age, delivery time, and number of children). The second part of the questionnaire was a researcher-made questionnaire examining the knowledge and attitude of pregnant women. Its validity was confirmed by six professors at Lorestan University of Medical Sciences (including gynecologists and radiology, general health, and ultrasound specialists), and its reliability was confirmed by Cronbach's alpha of 0.72 for knowledge and 0.76 for attitude. The questionnaire consisted of 21 questions, including correct, false, and unknowing. The correct answer for score 3, wrong answer for zero score and for unknowing option the score of one. In this section, the scores ranged from 0 to 66. Moreover, there were 12 questions on attitude scored on a Likert scale ranging from "totally agree" (1) to "totally disagree" (5). The scoring range was from 0 to 66, and the lower the score, the better the attitude is. Of course, in order to prevent the response of the questions to the respondent, two questionnaires have been made which are different in the knowledge section, so that the questionnaire is negatively presented in a questionnaire and it is presented in a photographic questionnaire.

After selecting the appropriate sample size, the questioner visited the centers and the questionnaire was administered to pregnant women. The ethical considerations in the research included the following: 1) Prior to the implementation, authorities approved the studies; 2) before data collection, research objectives for were explained to the participants and, if consent was given, they would be provided with the questionnaire; and 3) the questionnaires were anonymous. After collecting the data, they were imported in SPSS 21. Using descriptive statistics, mean and standard deviation (SD) were measured and charts were plotted. Furthermore, correlation coefficient was used to examine the

relationship between the variables, and independent t-test and ANOVA were run to compare the groups.

RESULTS

In this study, the age of pregnant mothers ranged from 15 to 49 years, with a mean of 28.31 years ± 55.5 years. Findings demonstrated that 35.1% of women experienced their first pregnancy, and 0.4% their seventh. About 30.80% of the participants were in the first trimester of pregnancy, 40.4% in the second trimester, and 28.8% in the third trimester. In addition, 38.7% of the participants and 45.3% of their husbands had a university education. In terms of occupation, 72% were homemakers. Table 1 lists some demographic variables.

Table 1: Frequency and relative distribution of pregnant mothers

| Variable | Pregnancy period | Number | Percent (%) |
|----------------------------|-------------------------------|--------|-------------|
| Number of Pregnancy | First | 79 | 35.1 |
| | Second | 83 | 36.9 |
| | Third | 42 | 18.7 |
| | Fourth | 14 | 6.2 |
| | Fifth | 3 | 1.3 |
| | Sixth | 3 | 1.3 |
| | Seventh | 1 | 0.4 |
| Individual Education level | Middle school degree | 39 | 17.3 |
| | Diploma | 99 | 44 |
| | Associate degree and Bachelor | 79 | 35.1 |
| | Higher than bachelor's degree | 8 | 3.6 |
| Job occupation | Housewife | 165 | 73.3 |
| | Employee | 33 | 14.7 |
| | Student | 12 | 5.3 |
| | Others | 15 | 6.7 |
| Husband's education | Illiterate | 9 | 4 |
| | Middle school degree | 38 | 16.9 |
| | Diploma | 76 | 33.8 |
| | Associate degree and Bachelor | 81 | 36 |
| | Higher than bachelor's degree | 21 | 9.3 |

The mean score of knowledge and attitude of the participants was analyzed by ANOVA. The mean score of knowledge was 43.06 ± 6.83 and the mean score of attitude was 53.97 ± 6.59. The results of the study revealed that the mean score of knowledge was significant in terms of education (p=0.00), husband's education (p=0.01), and age (p=0.01), but no significant relationship was observed with attitude. Also, the mean score of attitude was significant in terms of the number of deceased children (p=0.02). Findings indicated that there is no significant relationship between the month of pregnancy, the number of pregnancies, occupation, and

the number of children with knowledge and attitude (p>0.05) (Table 2).

Table 2: Relationship between demographic variables with knowledge and attitude

| Variables | Indicates | Number | Knowledge | Attitude |
|----------------------------|-------------------------------|--------|---------------|---------------|
| Individual Education level | Middle school degree | 36 | 40.25 ± 5.92 | 51.62 ± 7.57 |
| | Diploma | 92 | 42.08 ± 6.73 | 53.88 ± 6.18 |
| | Associate degree and Bachelor | 75 | 45.05 ± 6.86 | 54.89 ± 6.10 |
| | Higher than bachelor's degree | 8 | 47.50 ± 5.26 | 53.67 ± 3.08 |
| | | | p-value: 0.00 | p-value: 0.14 |
| Husband's education | Illiterate | 6 | 41.83 ± 3.31 | 51.71 ± 8.24 |
| | Middle school degree | 37 | 41.24 ± 6.78 | 53.79 ± 5.54 |
| | Diploma | 70 | 41.53 ± 6.45 | 53.80 ± 6.61 |
| | Associate degree and Bachelor | 79 | 44.62 ± 7.30 | 54.19 ± 6.94 |
| | Higher than bachelor's degree | 19 | 45.84 ± 5.24 | 53.43 ± 3.94 |
| | | | p-value: 0.01 | p-value: 0.91 |
| Number of dead children | 0 | 205 | 43.02 ± 6.92 | 53.96 ± 6.10 |
| | 1 | 2 | 45.50 ± 3.53 | 42.67 ± 14.57 |
| | 2 | 2 | 38.50 ± 2.12 | 60 |
| | 3 | 1 | 44 | 57 |
| | 5 | 1 | 48 | |
| | | | | p-value: 0.80 |

DISCUSSION

Results of the present study showed that the majority of pregnant women had moderate knowledge about the ultrasound. Larsen et al. reported that there is a good awareness of ultrasound. These results are probably due to the fact that pregnant women received a written record of family doctors before they were evaluated by ultrasound [13], and only women who were in the second trimester participated in the study, while in our study, mothers of all gestational ages were present. In another study, Lalor et al. presented a series of brochures containing information about the second trimester ultrasound before starting the scan in the waiting room, and the target group was pregnant women in the second month of pregnancy. However, the results showed that these brochures did not improve women's awareness, and more specialized information should be offered to them [14] and these brochures are provided when women have a lot of information on many aspects They

have received pregnancy, and as a result, the effectiveness of brochures is reduced [15]. There is also no significant difference between the awareness of primiparous and multi-agent women in relation to scan capabilities [16]. In our study, there was no significant relationship between the number of pregnancies and women's awareness.

CONCLUSION

In this study, most women had a negative attitude toward ultrasound and there was a significant relationship between attitude and the number of deceased children ($p=0.02$). The negative attitude in our study is probably due to the lack of awareness in this regard, indicating the inadequacy of the training by the health authorities. Considering the awareness of women in different fields, pregnant women seem to need more education.

According to the results, the level of awareness has a direct relationship with the level of education of the woman ($p=0.00$) and her husband ($p=0.01$) and the age of the person ($p=0.01$). Therefore, the training should be provided on this basis and classify people based on their level of education and age and offer each group separate training. People with a lower level of education should be given priority in receiving training and be provided with information that is understandable based on their level of literacy.

Moreover, as there is a direct relationship between the level of awareness and the husband's education, it is advisable that training sessions on pregnancy and ultrasound for pregnant women's spouses be provided in health centers so that they will improve their knowledge and, indirectly, increase the level awareness of pregnant women.

Considering that the majority of pregnant women had moderate awareness, it is necessary to train mothers on the need for an ultrasound, its benefits and disadvantages, and the use of ultrasound in the diagnosis of some fetal abnormalities through the formation of pregnancy training classes in health centers. Moreover, training can be offered using media and virtual networks or *via* educational films. This also contributes to the improvement of their attitudes. Furthermore, healthcare workers in contact with pregnant women should also be trained on this topic. The ultrasound specialist should also have a brief interview with pregnant women before starting the scan and improve women's awareness by providing accurate information about the ultrasound. The formation of pregnancy classes is one of the priorities of the Iranian Ministry of Health, and these classes are not systematically organized in health centers. Moreover, there is a need for a system of supervision on the implementation of regular classes in the form of a program designed in accordance with the guidelines of the Ministry of Health and Control and Evaluation, and it is essential to provide feedback on these classes. The number of articles in this domain is small, and the limited sample size in this study was a major limitation. However, the findings are useful for all health workers

and policymakers and pave the way for further research on this subject.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

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