



## Knowledge Levels, Attitudes and Behaviors of Pregnants About Prenatal Screening Tests: A Sectional Study

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### Research Article

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### ABSTRACT

To determine the knowledge levels, attitudes, and behaviors of pregnant women who come to the obstetrics clinic in a university hospital about prenatal screening tests.

It is a descriptive cross-sectional study. The population comprises approximately 900 pregnant women aged 28 weeks and beyond who applied to the Sivas Cumhuriyet University Faculty of Medicine, Obstetrics and Gynecology outpatient clinic between October and December 2021. The research questionnaire was used face-to-face with those who agreed to participate. The data form consisting of 21 questions included questions about pregnant women's descriptive characteristics and obstetric histories.

254 people participated. The mean gestational week of the participants was 34.9±3.9 (min:28-max:41). The most common screening tests were detailed ultrasound (80.7%) and double screening tests. Those who received information from their obstetrician had a significantly higher rate of having the difficulty. When the participants' knowledge scores about prenatal screening tests are evaluated, respectively, the Detailed ultrasound knowledge score was 5.6±0.9, Double test 5.0±1.3, Oral Glucose Tolerance Test(OGTT) 4.8±1.1, and Triple test 4.7±1.2(min:2-max:7). When the reasons for not having prenatal screening tests were questioned, the most common answer for all screening tests was "I don't think the test is necessary." For the OGTT, the second most common reason for not having it done was because they heard from the media that the test was harmful. The fact that the pregnant women who had a double and triple screening went to regular controls and had a high double-triple test knowledge score had a significant effect. Amniocentesis was recommended for 3.5% of the pregnant women based on prenatal test results, but none had amniocentesis. In case of unfavorable prenatal test results, most pregnant women were considering continuing the pregnancy.

In this study, we found that the testing rate increased with the increasing knowledge level of pregnant women and physician counseling. In this context, health professionals should provide women with the necessary education about screening and diagnostic tests to enable them to make informed decisions.

**Keywords:** Prenatal, Screening Test, Pregnant, Knowledge, Prenatal Screening Test

## Gebelerin Doğum Öncesi Tarama Testleri Hakkında Bilgi Düzeyleri, Tutumları ve Davranışları: Kesitsel Bir Araştırma

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### Öz

Bu çalışmada amaç; bir üniversite hastanesinde kadın doğum polikliniğine başvuran gebelerin doğum öncesi tarama testleri hakkındaki bilgi düzeyleri, tutum ve davranışlarını belirlemektir.

Tanımlayıcı kesitsel bir çalışmadır. Evreni Ekim-Aralık 2021 tarihleri arasında Sivas Cumhuriyet Üniversitesi Tıp Fakültesi Kadın Hastalıkları ve Doğum polikliniğine başvuran 28 hafta ve üzeri yaklaşık 900 gebe oluşturmaktadır. Araştırmaya katılmayı kabul edenlere araştırma anketi yüz yüze uygulanmıştır. 21 sorudan oluşan veri formu, gebelerin tanımlayıcı özellikleri ve obstetrik öykülerine ilişkin sorular içermektedir.

254 kişi katıldı. Katılımcıların ortalama gebelik haftası 34,9±3,9(min:28-max:41) idi. En yaygın tarama testleri ayrıntılı ultrason (%80,7) ve ikili tarama testleri idi. Kadın doğum uzmanından bilgi alanların testi yaptırmama oranı önemli ölçüde daha yüksekti. Katılımcıların doğum öncesi tarama testleri hakkındaki bilgi puanları değerlendirildiğinde sırasıyla; Ayrıntılı ultrason bilgi puanı 5,6±0,9, ikili test 5,0±1,3, Oral Glikoz Tolerans Testi (OGTT) 4,8±1,1 ve Üçlü test 4,7±1,2(min:2-max:7) idi. Doğum öncesi tarama testi yaptırmama nedenleri sorgulandığında tüm tarama testleri için en yaygın yanıt "Testin gerekli olduğunu düşünmüyorum" oldu. OGTT 'de ise ikinci sıklıkta yaptırmama nedeni, testin zararlı olduğunu medyadan duymalarıydı. Gebelerin ikili ve üçlü tarama yaptırmış olması, düzenli kontrollere gitmesi ve ikili üçlü test bilgi puanının yüksek olması anlamlı etki göstermişti. Prenatal test sonuçlarına göre gebelerin %3,5'ine amniyosentez önerildi, ancak hiçbirine amniyosentez yapılmadı. Doğum öncesi test sonuçlarının olumsuz çıkması durumunda gebelerin büyük çoğunluğu gebeliğe devam etmeyi düşünmekteydi.

Bu çalışmada gebelerin bilgi düzeyi ve hekim danışmanlığı arttıkça tarama testi yaptırmama oranlarının arttığını bulduk. Bu bağlamda sağlık profesyonelleri, kadınlara bilinçli kararlar verebilmeleri için tarama ve tanı testleri konusunda gerekli eğitimi vermelidir.

**Anahtar sözcükler:** Doğum Öncesi, Tarama Testi, Gebe, Bilgi, Doğum Öncesi Tarama Testi

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## Introduction

Prenatal care (PNC) is essential to improve infant health outcomes such as timely delivery and average birth weight. One of the goals of PNC is to identify women whose fetuses are at risk for congenital and genetic conditions. Therefore, genetic evaluation, screening, and testing have been offered in the context of PNC for many years in many countries<sup>1, 2</sup>. There have been revolutionary changes in this field in the last 40 years. Having prenatal screening tests significantly reduces the mortality and morbidity rate in mother and baby<sup>3</sup>. Prenatal diagnosis and screening tests are accepted worldwide and applied in Turkey. These tests used: 11-14. nuchal translucency and combined test (double test) by ultrasonography between weeks 16-20, maternal serum AFP, triple and quadruple test between weeks 16-22, 18-22. It is fetal anomaly screening between weeks (Detailed USG). Gestational diabetes screening is performed with a 75-gram Oral Glucose Tolerance Test (OGTT) between weeks 24-28th of pregnancy<sup>4</sup>. When double and triple tests are used together, Down Syndrome can be detected with up to 90% accuracy and less than 5% false positivity<sup>5</sup>. These tests are free for all women in Turkey.

Pregnant women don't need to have these tests in our country. However, many factors affect the decision to have screening tests. First of all, family physicians and obstetricians, the social environment of the pregnant woman, and the media affect the information stage. Pregnant women's educational status and socioeconomic level are also effective in accessing health services and having screening tests<sup>6,7</sup>. There are different studies in the literature regarding the level of knowledge about prenatal tests<sup>8,9</sup>. However, studies examining in detail the approach to the trials and the reasons for not having them done are limited.

Our study aims to determine the knowledge level of pregnant women who come to the obstetrics clinic in a university hospital about prenatal screening tests and the factors affecting their decision to have the tests.

## Statistical analysis

The collected data were analyzed using SPSS (Statistical Package for Social Sciences) for the Windows Version 25 package program. Normality analysis of numerical data was diagnosed with the Shapiro-Wilk test. Descriptive statistical analyses of the data were first performed. Frequencies for categorical data and measures of central distribution (Mean  $\pm$  Standard Deviation) for numerical data were calculated. Whether the means of normally distributed numerical data differed significantly between the two independent groups was analyzed with the Independent Samples T-test. The chi-square test was used to compare categorical data. A p-value of less than

## Materials and Methods

### Type of the study

This study is a descriptive cross-sectional study.

### Design

The research population comprises approximately 900 pregnant women who are 28 weeks or older and applied to the Sivas Cumhuriyet University Faculty of Medicine, Obstetrics and Gynecology outpatient clinic in the three months starting October 2021. According to the sample calculation, it was aimed to reach at least 209 people at the 90% confidence interval. A research questionnaire was given to 254 of these pregnant women who agreed to participate in the study, and one of the researchers applied to face to face. Data were collected for the survey between October and December 2021. Before the interview, participants were informed about the study, and their informed consent was obtained.

### Data collection tool

The data form used in the study consisted of 21 questions. The first 15 questions were about the descriptive features (e.g., age, occupation, education level, living place, income status, habits, history of kinship with the spouse, and chronic diseases) of the pregnant women and their obstetric history (number of pregnancies, gestational week, previous pregnancy situations, pregnancy follow-ups and where they were followed, baby with anomaly history). The last six questions were about prenatal screening tests (e.g., knowledge levels about the prenatal tests, sources of information, cases of having them done, and why they did not have it done).

The researchers prepared questions about the level of knowledge of prenatal screening tests by reviewing the literature. The total knowledge score was calculated by giving 1 point for correct answers and 0 points for incorrect answers. As the score increased, the level of knowledge about the test increased.

0.05 was considered for statistical significance, with a 95% CI.

### Permissions

The Ethics Committee of The Sivas Cumhuriyet University for Noninvasive Clinical Research approved the study (2021/04-52).

## Results

### Demographic Data and Characteristics of Pregnant Women

Two hundred fifty-four people volunteered to participate in the study. The mean age of the participants was 28.0 $\pm$ 5.1 (min:17- max:43). Education levels were 37.0% (n=94) primary education, 34.3%

(n=87) high school, and 28.7% (n=73) higher education. Income levels were 35.0% (n=89) low-income level, 31.1% (n=79) middle-income level, 33.9% (n=86) high-income level. Education levels were 37.0% (n=94) primary education, 34.3% (n=87) high school, and 28.7% (n=73) higher education. Income levels were 35.0% (n=89) low-income level, 31.1% (n=79) middle-income level, 33.9% (n=86) high-income level.

The mean gestational week of the participants was  $34.9\pm 3.9$  (min:28-max:41). The mean number of pregnancies was  $2.4\pm 1.4$  (min:1-max:9). The number of living children was  $1.1\pm 1.2$  (min:0-max:7). None of the pregnant women had a history of children with anomalies. Most of them had regular follow-ups of pregnancy (78.7% regularly, 16.9% partially regularly). 33.9% of the pregnant had follow-ups in the state hospital, 46.5% in the university hospital. Pregnancy-related data are shown in Table 1.

**Table 1. Participants' information about pregnancy**

N=254	n	%
Pregnancy loss		
Yes	59	23.2
No	195	76.8
Cause of pregnancy loss (N=59)		
Spontaneous abortion	44	74.6
Voluntary termination	2	3.4
Medical termination	6	10.4
Premature-stillbirth	7	11.9
Pregnancy complication		
Yes	29	11.4
No	225	88.6
Abnormal fetal conclusion		
Yes	16	6.3
No	238	93.7
Where was the pregnancy follow-up done?		
Family medicine	9	3.5
Private clinic	41	16.1
Public Hospital	86	33.9
University Hospital	118	46.5
Pregnancy follow-up scheme		
Regular	200	78.7
Partly regular	43	16.9
Irregular	11	4.3
Cigarette		
Smoking	26	10.2
Stopped smoking during pregnancy	29	11.4
Never smoked	199	78.3

Pregnant women most frequently had a detailed ultrasound (80.7%) and double screening test. The rate of those with double and triple screening tests was 51.6%. The frequency of pregnant women who did not

have any screening test was 14.2%. The status of pregnant women to have non-invasive prenatal screening tests is shown in Table 2.

**Table 2. History of having a noninvasive genetic screening test**

	n	%
Double test only	59	23.2
Triple test only	22	8.7
Both the double and triple test	131	51.6
Detailed ultrasonography	205	80.7
Oral Glucose Tolerance Test (OGTT)	93	36.6
No screening test	36	14.2

When asked about the sources of information about screening tests, the most common answer for all screening methods was Obstetrician and Family Physician second. In all prenatal screening tests, those who received notification from the obstetrician had a

significantly higher rate of getting the test than those who did not. The status of obtaining information from family physicians and obstetricians of those who had prenatal screening tests is shown in Table 3.

**Table 3. The Status of Obtaining Information From The Family Physician or Obstetrician of Those Who Had Prenatal Screening Test**

Having the prenatal screening test	Having information from an Obstetrician		p	Having information from FP		p
	Yes	No		Yes	No	
Double test	129 (67.9%)	61 (32.1%)	<0.001	49 (25.8%)	141 (74.2%)	0.065
Triple test	108 (70.6%)	45 (29.4%)	<0.001	45 (29.4%)	108 (70.6%)	0.001
Detailed ultrasonography	142 (69.3%)	63 (30.7%)	0.003	66 (32.2%)	139 (67.8%)	0.001
OGTT	65 (69.9%)	28 (30.1%)	<0.001	36 (38.7%)	57 (61.3%)	0.159

FP: Family Physician, OGTT: Oral Glucose Tolerance Test. Chi-square test was used for analysis

When the participants' knowledge scores about prenatal screening tests are evaluated, respectively, the Detailed ultrasound knowledge score is 5.6±0.9 (min:2-max:7), the Double test knowledge score is 5.0±1.3 (min:2-max:7), OGTT knowledge score is 4, 8±1.1 (min:2 -max: 7) and Triple test knowledge score was 4.7±1.2 (min:2-max:7).

answer for all screening tests was, "I don't think the test is necessary." The second most common reason for not having the dual screening test (32.8%) and detailed ultrasound (30.6%) was because they missed the test. For the OGTT, the second most common reason for not having it done was because they heard from the media that the test was harmful. The reasons for not having a prenatal screening test are shown in Table 5.

When pregnant women were questioned why they did not have prenatal screening tests, the most common

**Table 5. Reasons for not having a prenatal screening test.**

	Double test (not take n=64)	Triple test (not take n=101)	Detailed ultrasonography (not take n=49)	OGTT (not take n=161)
Reason for not taking the test	n (%)	n (%)	n (%)	n (%)
Don't think it's unnecessary	31 (48.4)	67 (66.3)	27 (55.1)	96 (59.6)
Do not hear from the media that it is harmful.	2 (3.1)	1 (0.9)	3 (6.1)	48 (29.8)
Not recommended by my doctor.	5 (7.8)	23 (22.7)	6 (12.2)	24 (14.9)
Don't miss your time	21 (32.8)	14 (13.8)	15 (30.6)	24 (14.9)
Fear of bad outcomes.	4 (6.2)	5 (4.9)	1 (2.0)	10 (6.2)
My spouse/family elders do not allow me to take the test.	0 (0)	1 (0.9)	0 (0)	8 (5.1)
Don't think that the test will harm my baby.	2 (3.1)	2 (1.8)	2 (4.0)	19 (11.8)

Age (p=0.137), education level (p=0.552), place of residence (p=0.285), income level (p=0.410), smoking status (p=0.253), working group (p=0.463), being a consanguineous marriage (p=0.501), presence of chronic disease in the mother (p=0.423), previous pregnancy loss (p=0.492), the institution of follow-up (p=0.330) did not have a significant effect on the fact

that the pregnant women had double and triple screening. Having a double test (p=0.005) and triple screening test(p<0.001), regular check-ups(p=0.001), and high double-triple test knowledge scores had a significant effect. Table 6 shows the factors affecting pregnant women's double and triple screening.

**Table 6. Factors affecting the double and triple screening of pregnant women**

	Had the double and triple test	Not had the double and triple test	p
Regular visits to checkups*	n (%)	n (%)	
Yes	114 (57.0)	86 (43.0)	<b>0.001</b>
No	17 (31.5)	37 (68.5)	
Double test knowledge score(M±SD)**	5.2±1.2	4.7±1.4	<b>0.005</b>
Triple test knowledge score(M±SD)**	5.1±1.1	4.4±1.3	<b>&lt;0.001</b>

Amniocentesis was recommended for 3.5% (n=9) of pregnant women according to prenatal test results. However, none of these pregnant women had undergone amniocentesis. Would you continue the pregnancy if there is any abnormality in your test results? 2.4% (n=6) of the pregnant women said they In our study, we aimed to evaluate the awareness of women who came for pregnancy follow-up in a tertiary hospital about prenatal tests and the factors affecting their decision to have them.

Routine prenatal testing is recommended as a part of prenatal care for all pregnant women in Turkey. Nacar et al. reported that 76.9% of pregnant women had at least one prenatal screening test <sup>7</sup>. In a different study conducted in Turkey, a vast % of pregnant women, 72.5%, approached all screening tests positively <sup>6</sup>. In our study, the rate of pregnant women with any prenatal screening test was 85.8%. It was thought that the fact that most patients (80.4%) had follow-ups at the state hospital or university hospital level affected this issue.

Within the scope of prenatal screening tests, the double test is offered between 11-14 weeks in the current practice. In the study by Seven et al., 36.1% of the pregnant women had either a double or a triple test <sup>8</sup>. In their research, Bilgin et al. found the double and triple difficulties rate as 41% <sup>10</sup>. This rate is similar in different studies in our country <sup>9, 11</sup>. In our study, the rate of those with double and triple tests (51%) was higher than in similar studies. This may be because the research was conducted in a university hospital, and the awareness of Turkish women increased compared to previous years <sup>12</sup>.

In our study, the most common test performed by pregnant women was a detailed USG and double screening test. This may be because they are the best-known screening tests. The results are similar to the literature <sup>9,13</sup>.

Sociocultural and ethical-moral systems may determine the decision to have prenatal testing. However, providing antenatal counseling has a crucial role in guiding decisions based on the level of knowledge <sup>14</sup>.

thought of terminating their pregnancy, and 68.1% (n=173) of them thought of continuing the pregnancy. 29.5% (n=75) answered that they cannot decide on this issue.

### Discussion

Therefore, pretest counseling is essential in antenatal care to ensure women understand the limitations and advantages of prenatal testing, whether they want to learn about their fetuses, and what actions to take in the event of an adverse outcome <sup>15</sup>. In our study, the knowledge level of the pregnant women and the counseling from the obstetrician positively affected their having these tests. A different study found that most women received information about prenatal tests, and getting information from an obstetrician most encouraged them to have the trial <sup>16</sup>. This is consistent with our study.

According to the literature, genetic abnormalities and previous miscarriages encourage pregnant women to undergo prenatal testing <sup>8, 16, 17,18</sup>. In our study, age, consanguineous marriage, and last pregnancy loss did not affect the fact that pregnant women had double and triple screening tests. This may be due to the absence of pregnant women with an anomaly in our study.

In Turkey, it is recommended to screen for gestational diabetes between the 24th and 28th weeks of pregnancy <sup>4</sup>. The rate of OGTT in pregnant women in our study was lower than in other tests. When the reasons for not having the difficulty were questioned, the second most common reason was hearing from the media that the test was harmful. Knowledge level about OGTT was also lower than on other tests. Unfortunately, this situation is similar in many studies conducted in Turkey <sup>6, 19, 20</sup>. The uncontrolled statements about diabetes screening during pregnancy in the Turkish media, especially in recent years, affect this situation.

In Islamic beliefs, there are several legitimate reasons for terminating a pregnancy. The most important

reason, and for some Muslim jurists the only reason, is that the mother's health is in danger, and the ongoing pregnancy can even bring about maternal death. We did not question religious beliefs in our research. Turkey is a country with a 98% Muslim population. In our study, amniocentesis was recommended for 3.5% of pregnant women, according to the results of prenatal tests. But none of these pregnant women had undergone amniocentesis. In the case of fetal anomaly, only 2.4% of the women thought of terminating the pregnancy, and most continued the pregnancy. The study conducted by Kutlu et al.<sup>13</sup> determined that the most common reason stated by pregnant women who did not want to have screening tests was "I find it unnecessary because I do not want to terminate my pregnancy." The most common reason why pregnant women did not have all the tests in our study was that they thought they were unnecessary. This may be because they believe the test result will not affect their decision about the continuation of the pregnancy due to their religious beliefs. This situation is similar to the effects of studies on Muslim women's approaches in different countries in the literature<sup>21,23</sup>.

Pregnant women and their spouses should be informed about prenatal screening by all health professionals, especially obstetricians and family physicians, and correct counseling should be provided<sup>24</sup>. Although the awareness of pregnant women about prenatal tests is increasing in Turkey, it is still insufficient. It should also be explained that these tests are only screening tests and only identify risks. Pregnant women who are given accurate information and make conscious decisions have a more positive approach to tests<sup>25</sup>.

## Conclusion

As a result, our study determined that the level of knowledge and the guidance of physicians were very influential in testing. In particular, the media can be used as an effective tool in providing accurate information about OGTT. Most pregnant women thought of continuing their pregnancy even with negative test results. As prenatal genetic screening and testing are optional services, healthcare professionals need to provide women with the necessary education about screening and diagnostic testing to enable them to make informed decisions.

## Limitations

Our research was conducted in a single center and a 3rd level hospital. Results cannot be generalized. More qualitative studies are needed to evaluate the reasons for having and not having screening tests. In addition, the researchers created questions measuring the level of knowledge through a literature review, which is not a valid questionnaire.

## Declaration of Conflicting Interests

The authors declared no potential conflicts of interest concerning this article's research, authorship, and publication.

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