

# A Study on Nursing Students' Subjectivity of Prenatal Tests

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## Abstract

The development of prenatal tests has brought about profound changes in the health of pregnant women and their families in various ways. This study aims to find out the subjectivity of prenatal tests recognized by nursing students, and classify them into different types, and provide them as basic sources for developing educational programs on those students on prenatal tests. This study used Q methodology to develop the data. Fourteen nursing students of A university were told to classify 40 statements about prenatal tests. The collected data was analyzed using the QUANL PC Program. The nursing students' perception of prenatal tests was classified into two factors. The subjectivity types of prenatal tests were 'Type of regarding the strengths of prenatal tests as important' and 'Type of defending subjects as a nurse'. In the results of analyzing the subjectivity of prenatal tests, there were two factors, which explained 26.99% of total variance such as 17.12% for Factor 1 and 9.87% for Factor 2. The Factor 1 could be regarded as the factor that explains the perception of prenatal tests the most. Among 14 research subjects, eight subjects belonged to Factor 1 while six subjects belonged to Factor 2. This study provided the basic data for understanding and educating the clinical nurses' perception of prenatal tests.

**Keywords:** Prenatal Tests, Nursing Students, Subjectivity, Q-methodology, Nurses.

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## INTRODUCTION

In 2017, the domestic mothers' average age for childbirth was 32.6 years old; the percentage of aged mothers in their 35 or up was 29.4%; and the percentage of aged mothers in their 35 or up giving their first childbirth was 13.1%[1]. Like this, with the great increase of aged pregnant women, the number of subjects of prenatal tests is also quickly increasing.

Meanwhile, owing to the rapid development of accurate and simple prenatal test techniques including the Non-invasive Prenatal Tests(NPT), and the recent availability of early induced-abortion surgery[2], the controversy over pros and cons of the Abortion Act is rising as an issue again[3]. According to this social change related to medical science, currently, there have been discussions in which nurses should be able to help mothers and their families to safely make decisions related to prenatal tests, based on more practical and specialized knowledge[4, 5].

The development of prenatal genetic test has brought about enormous changes to the health of pregnant women and their families. Even though this gave positive effects in the aspect of health-related decision making, quality of health, and safety & accessibility, this also raised serious medical/ethical issues in the overall patients & families, medical personnel, the healthcare system, and society

[6][19][20].

In recent years, nurses have been stuck in the image of a woman's job, and nursing has developed around motherhood, one of the characteristics of women[7][21]. Nursing, which is composed of women-oriented and developed, can have a great influence on one group of nurses, patients, and health care workers beyond individual female nurses. Also, since they are made up of women, their perception of childbirth and childcare is bound to be important[8].

Nurses are key personnel with the largest share of the healthcare scene and the most contact with the target and must provide safe and high-quality care to the target within a limited time in a rapidly changing healthcare environment [9]. The subjectivity of perception when dealing with subjects in the nursing field has a great influence on the nursing they perform. Therefore, it is important to understand the perceptions of nurses and prospective nurses.

Ethical issues experienced by nurses in complex clinical sites are gradually increasing, and conflicts of different ethical principles have led to ethical conflicts. Recently, there has been a renewed conflict between nurses' obligations to improve their health and safety and their beliefs to fulfill their medical personnel's obligations despite the limitations of medical resources. As such, the emergence of new ethical conflicts that could not be experienced in the

past raised the need for ethical competency as a key to solving various ethical problems in the clinical field, and the subjective perception of nurses had a lot of influence on ethics[10].

Therefore, the aims of this study to provide basic data necessary to develop differentiated education programs according to the characteristics of each type of prenatal tests recognition as a pre-nurse before going to the nursing site where prenatal tests are conducted from the perspective of nursing students.

The specific research objectives for this are as follows.

1) This study categorizes the nursing students' subjective recognition of prenatal tests.

2) This study analyzes and describes the characteristics of each type of nursing students' recognition of prenatal tests.

## RESEARCH METHODS

### 1. Research Design

To verify the subjectivity of prenatal tests perceived by nursing students, this study applied the Q-methodology.

### 2. Selection of Q-Population and Q-Sample

In this study, more than 200 Q populations were formed through previous studies on prenatal tests and nursing students, newspaper articles and Internet press releases, and in-depth interview processes of three nursing students. These researchers repeatedly read the Q population collected for Q sample selection several times and deleted or integrated statements in consideration of whether the meaning was duplicated or representative. To check the validity of the categories and contents derived along with the subject of the study, two nursing students and a nursing professor with a sufficient understanding of the Q methodology were reviewed and opinions were readjusted after adjusting opinions. Subsequently, a preliminary survey was conducted on one nursing student by adopting 40 questions with the highest discrimination and validity among the statements organized by category, and 40 Q samples were finally selected after modifying words or vocabulary that were difficult to understand [Table 1].

[Table 1] Q Statements

No.	Statement
1	The types of prenatal tests related to bioethics and safety should be expanded.
2	According to the increase of genetic disorders, the prenatal tests are necessary.
3	A family with the family history of genetic disorder should have the right of self-determination of prenatal genetic test.
4	To protect a fetus, the amniotic fluid test should be banned.
5	The ultrasound is the safest test for both fetus and mother to know the health status of fetus.
6	In case a fetus has a congenital disease, the artificial abortion could be selected in the safe gestational age through the prenatal tests.
7	The invasive prenatal test should be avoided if possible.
8	The insurance benefit should be applied to various prenatal tests.
9	The phased prenatal tests following the gestational age are essential.
10	The DNA test has the highest reliability among the prenatal tests.
11	A healthcare provider should defend mothers' right of self-determination of prenatal tests.
12	The mothers who want to get an abortion can abuse the prenatal tests.
13	Before the prenatal tests, a genetic counseling should be essentially provided.
14	If a chromosomal abnormality is detected through the prenatal tests, an abortion should be allowed.
15	The prenatal tests bring about ethical and social problems.
16	It is necessary to have the rational amendment of laws in relation to gene abnormalities according to the prenatal tests.
17	To provide information about the prenatal tests, a nurse for genetic counseling should be assigned.
18	As the gestational age of mothers is increasing, they show more positive attitude toward the prenatal tests.
19	To see the growth and development of a fetus, the prenatal tests are essential.
20	The false positive of the prenatal test increases mothers' anxiety.
21	The prenatal tests can cause infection in fetuses.
22	There is no 100% reliability in the prenatal tests.
23	A proper delivery method can be selected through the prenatal tests.
24	Before pregnancy, the prenatal tests for men are necessary.
25	Through the prenatal tests, the possibility of natural pregnancy can be raised.
26	Through the ultrasound, people can get ready to become parents.
27	The greatest weakness of the prenatal tests is cost.
28	After the prenatal tests, the health care of mothers could be effectively done.
29	The non-invasive test has the lower reliability than the invasive test.
30	Getting the prenatal tests from a specialized ob/gyn is preferred to a tertiary hospital.
31	The prenatal tests before pregnancy influence the health of fetus.
32	Relatively, the prenatal tests in the early stage of pregnancy are important.
33	The prenatal tests are essential to the pregnant women with previous experiences of miscarriage in the past.
34	The parents who have seen the abnormalities of fetus through the prenatal tests, feel hopeless.
35	The prenatal tests show the health status of both fetus and mother.
36	It is necessary to promote the prenatal tests before pregnancy.
37	Among the prenatal tests before pregnancy, the sexually transmitted disease test is essential.
38	The prenatal tests before pregnancy decrease the risks of stillbirth and miscarriage.
39	It is necessary to promote the prenatal tests for men.
40	For mothers who reside in islands and remote rural areas, the health care centers should provide the prenatal tests.

### 3. P-sample selection method

Q-methodology is a qualitative research study that emphasizes individual inertia, focusing on differences in meaning or importance within individuals, not on individual differences, and is based on small sample doctrine [12]. In the P sample of this study, a total of 14 students who fully explained the purpose of the study to students enrolled in one nursing department and agreed to participate in this study were selected.

### 4. Q-Classification and Data Analysis Method

The Q classification process is a process in which each individual creates a voluntary definition of prenatal malformed child testing by classifying the selected study subjects with statements from the Q sample in a forced normal distribution method [12]. Data were collected using Q cards for 14 nursing students at A University. Most of the time it took one study subject to complete the Q-classification was 15-20 minutes. In the distribution chart of the Q sample, the statements selected by the study subjects were classified from strong positivity to strong negation according to the importance of their opinions. The statement (Q1) on the prenatal malformed child test was classified on a 12-point scale. After that, a later interview was conducted with the subject in relation to the statement classified in the two extremes. For Q factor analysis, the Principle Component Factor Analysis (varimax) method was used. The classification of types was selected in consideration of the results calculated by entering the number of factors variously based on the Eigen value 1.0 or higher and the total explanatory variation. The collected data were scored with 1 to 12 points, focusing on the cards forcibly distributed in the Q sample distribution table. The assigned conversion scores were coded in the order of Q sample numbers and treated as main factor analysis by the QUANL PC Program. Data analysis was processed using the QUANL pc program [13-15].

### 5. Ethical Consideration of Research Subjects

It was explained to the subject that it could be stopped at any time during the study after obtaining the subject's voluntary consent before the study. In order to respect the rights of the subjects and ensure the privacy and privacy of the subjects, all information collected through this study was confidential and coded and Q sorted throughout the data analysis process.

## RESULTS

As a result of conducting a Q-factor analysis on the subjectivity of prenatal tests of nursing students using the QUANL pc program, two types were found.

Participants in this study were conveniently extracted from 14 nursing college students. The general characteristics of

the study participants are shown in Table 2. The total number of subjects surveyed is 14, and the average age is  $21.79 \pm 2.64$ . Of them, 78.57 percent did not have a religion and 21.43 percent did not.

[Table 2] General Characteristics

Type	No	Age	Gender	Religion	FWS*
Type 1	2	21	F	No	.1301
	3	21	F	Christian	.6328
	5	20	F	No	.3623
	6	20	F	No	1.0833
	9	20	F	No	.6857
	10	23	M	No	.3733
	11	21	F	No	.7961
	12	20	F	No	1.1586
Type 2	1	20	F	No	.5288
	4	21	F	Christian	.5460
	7	29	F	No	.5258
	8	22	F	No	.2766
	13	26	F	No	1.3172
	14	21	F	Christian	.5908

\*FWS: factor weight score

To analyze the subjectivity of nursing students' prenatal tests by type, first, the characteristics of each type were described based on statements belonging to each type. The Q response of the P sample (research participant) was divided into upper and lower questions, and two factors were extracted. In the Q methodology, the higher the factor weight among the people belonging to each type, the more typical or ideal people representing the type.

To analyze the characteristics of each type of prenatal test, meaning was given and interpreted centering on statements with a standard score of  $\pm 1.00$  or higher among the items of statements classified. In this study, 8 people with factor weights of 1.0 or more belonged to Type 1 and 6 people in Type 2.

As a result of analyzing the subjectivity of prenatal tests using the PC QUANL program, two factors were found, and 26.99% of the total variance was explained. The first factor was 17.12% and the second factor was 9.87%. Since the first factor has an explanatory power of 17.12%, it can be seen as the factor that explains the perception of prenatal tests the most [Table 3]. Of the total 14 subjects surveyed, 8 were identified as belonging to the 1 factor and 6 were identified as belonging to the second factor. Those corresponding to each factor refer to a group that has a similar response to prenatal tests.

[Table 3] Eigen Value, Variance, and Cumulative Percentage

	Type I	Type II
Eigen Value	2.7390	1.5792
Variance (%)	.1712	.0987
Cumulative(%)	.1712	.2699

The types of subjectivity of prenatal tests that were produced by this type analysis method could be presented as follows.

- Type of Regarding the Strengths of Prenatal Tests as Important: Total eight subjects belonged to Type 1. The subjects of Type 1 showed strong affirmation to the statements such as 'The ultrasound is the safest test for both fetus and mother to know the health status of fetus.(Z=2.35)', 'To see the growth and development of a fetus, the prenatal tests are essential. (Z=1.53)', and 'For mothers who reside in islands and remote rural areas, the health care centers should provide the prenatal tests.(Z=1.42)'[Table 4]. The subject with the highest factor weight in Type 1 was No. 14(1.1586), and the statements this subject agreed on the most were No. 5 and No. 19. The subjects of Type 1 showed strong negation to the statements such as 'The non-invasive test has the lower reliability than the invasive test.(Z=-2.37)', 'To protect a fetus, the amniotic fluid test should be banned. (Z=-2.20)', and 'The mothers who want to get an abortion can abuse the prenatal tests. (Z=-1.27)' [Table 4]. The subject with the lowest factor weight in Type 1 was No. 5(0.3623), and the statements this subject negated the most were No. 29 and No. 4.

In the characteristics of Type 1, they said the prenatal tests would be safe and essential to understand the health status of both fetus and mother. Thus, they thought the prenatal tests should be performed for healthcare of perinatal period, and it would be also necessary to support for pregnant women suffering from economic hardship. As time passes, the necessity of prenatal tests is gradually increasing. Also, they do not agree on the argument in which the prenatal tests should be banned due to the problems like abuse or side effects that could be caused by the prenatal tests. To carry out the prenatal tests, the strengths would be the most important, so there should be the measures for additional risks or economic problem. Thus, Type 1 was named 'Type of perceiving difficulties in rearing the prenatal tests'.

- Type of Defending Subjects as a Nurse: Total six subjects belonged to Type 2. The subjects of Type 2 showed strong affirmation to the statements such as 'A healthcare provider should defend mothers' right of self-determination of prenatal tests.(Z=1.69)', 'In case a fetus has a congenital disease, the artificial abortion could be selected in the safe gestational age through the prenatal tests.(Z=1.38)', and 'The parents who have seen the abnormalities of fetus through the prenatal tests, feel hopeless.(Z=1.36)'[Table 4]. The subject with the highest factor weight in Type 2 was No. 15(1.3172), and the statements this subject agreed on the most were No. 11 and No. 6. The subjects of Type 2 showed strong negation to the statements such as 'The mothers who want to get an abortion can abuse the prenatal tests.(Z=-2.25)', 'The prenatal tests bring about ethical and social problems.(Z=-2.18)', and 'Through the ultrasound, people can get ready to become parents.(Z=-1.95)'[Table 4]. The subject with the lowest factor weight in Type 2 was No. 8(0.2766), and the statements this subject negated the most were No. 12 and No. 15.

In the characteristics of Type 2, the nursing students judge every situation in the position of defending mothers who are recommended to get the prenatal tests. They thought a healthcare provider should defend mothers' right of self-determination of prenatal tests, and the mothers could choose the prenatal tests and a consequent abortion. They aimed to minimize a sense of loss and to respect their right of choice in the position of couples. However, they did not agree on the thought in which the prenatal tests would be a means of abortion or bring about ethical/social problems. They thought the parents' decision or choice would be the most important to maintain pregnancy, and this should be defended by nurses who were caring them at the nearest site. Thus, Type 2 was named 'Type of defending subjects as a nurse'.

[Table 4] Representative Items and Z-score of Prenatal Tests

Representative items of type					
Factor	Type	No	Representative items	Mean (SD)	Z-score
Factor1 (N=8)	Type1	5	The ultrasound is the safest test for both fetus and mother to know the health status of fetus.	8.13(2.100)	2.34
		19	To see the growth and development of a fetus, the prenatal tests are essential.	7.25(2.252)	1.53
		40	For mothers who reside in islands and remote rural areas, the health care centers should provide the prenatal tests.	8.00(1.690)	1.42
		1	The types of prenatal tests related to bioethics and safety should be expanded.	6.75(2.053)	1.11
		2	According to the increase of genetic disorders, the prenatal tests are necessary.	7.00(1.852)	1.07
	Type2	29	The non-invasive test has the lower reliability than the invasive test.	2.38(1.302)	-2.37
		4	To protect a fetus, the amniotic fluid test should be banned.	2.13(1.356)	-2.20
		12	The mothers who want to get an abortion can abuse the prenatal tests.	3.50(1.927)	-1.37
		33	The prenatal tests are essential to the pregnant women with previous experiences of miscarriage in the past.	4.50(2.828)	-1.19
		27	The greatest weakness of the prenatal tests is cost.	4.50(2.673)	-1.15
Factor2 (N=6)	Type3	11	A healthcare provider should defend mothers' right of self-determination of prenatal tests.	8.17(1.472)	1.69
		6	In case a fetus has a congenital disease, the artificial abortion could be selected in the safe gestational age through the prenatal tests.	6.67(3.559)	1.38
		34	The parents who have seen the abnormalities of fetus through the prenatal tests, feel hopeless.	6.83(2.639)	1.36
		2	According to the increase of genetic disorders, the prenatal tests are necessary.	6.83(2.041)	1.28
		3	A family with the family history of genetic disorder should have the right of self-determination of prenatal genetic test.	6.83(1.169)	1.10
	Type4	12	The mothers who want to get an abortion can abuse the prenatal tests.	2.33(1.211)	-2.25
		15	The prenatal tests bring about ethical and social problems.	2.50(1.378)	-2.18
		26	Through the ultrasound, people can get ready to become parents.	2.67(0.816)	-1.95
		25	Through the prenatal tests, the possibility of natural pregnancy can be raised.	3.50(1.643)	-1.36
		18	As the gestational age of mothers is increasing, they show more positive attitude toward the prenatal tests.	3.33(1.211)	-1.34

## DISCUSSIONS

In the results of this study, the types of subjectivity of prenatal tests perceived by nurses were Type 1: 'Type of regarding the strengths of prenatal tests as important' and Type 2: 'Type of defending subjects as a nurse'. This study aims to discuss the characteristics of each type.

Type 1 shown in this study was 'Type of regarding the strengths of prenatal tests as important'. According to them, the prenatal tests were safe tests equipped with strengths of showing the health status of fetus. As essential tests, the opportunities for mothers to get such tests should be expanded, and there should be policy-level devices for socially and economically supporting the mothers who could not get such tests, they said.

Another research by Jun et al., (2017) described the more the mothers' experiences in pregnancy were accumulated, they started understanding the purpose of prenatal tests for themselves, and also showed a certain degree of autonomous decision-making ability [11]. Boardman (2014) also argues that it is not safe for pregnant women to make decisions related to prenatal tests by just depending on their own experiential knowledge, and that the nurses' role is important for establishing the environment that provides information about prenatal tests to pregnant women, helps them approach the relevant healthcare service, and enables them to safely fill out a prior consent form[12].

The counseling service before/after the prenatal screening & diagnostic test is performed very limitedly in the busy and crowded outpatient clinic, and most of the outpatient service tends to depend on doctors' explanation, so it is difficult to fully expect to see mothers' autonomous decision-making function[11]. Even though doctors do not provide information that could be easily understood by patients and their families like using the medical terms as they are such as mortality and prevalence, the nurses or genetic counselors can explain the relevant contents more easily to patients and their families, and also provide unbiased information to them, so the genetic counselors' service is shown to be more beneficial to both patients and their families[13].

Therefore, it would be necessary to strengthen such educational or counseling programs for mothers for enhancing the knowledge and needs for information about prenatal screening & diagnosis through nurses in the outpatient clinic of ob/gyn, and also to strengthen the education about sensitivity to the protection of mothers' autonomy. Considering the recent applicability of non-invasive prenatal test to the early stage of pregnancy, the development of early abortion and prenatal genetic screening techniques such as drug-based abortion, and changes in the Abortion Act of Korea, the role of professional nurses for helping mothers' rational decision-making before/after prenatal tests is growing more important. For this, it would be necessary to strengthen such educational or counseling programs for mothers for raising

the nurses' knowledge about prenatal tests and meeting the needs for information.

Type 2 was 'Type of defending subjects as a nurse'. The subjects said that the mothers' decision in relation to prenatal tests and consequent choice should be respected, and their position should be defended as well. As a profession, the nurses think they should consider the subjects' emotions brought by the result of prenatal tests and help their choice.

As the genetic counseling has not been vitalized and there are almost no helps from supporting group, in order to help mothers in a state of shock and extreme fear, and also to help them make autonomous and rational decisions, the nurses should be equipped with not only medical knowledge about prenatal tests, but also solid ethical knowledge[14].

Comparing the priority of needs for information, compared to mothers, the nurses showed the higher needs for information about the interpretation of test results and maternal care in case the result of prenatal tests was positive. This is fully reflecting that the nurses are going through difficulties and confusion in the complex decision-making process of mothers after the result of prenatal tests comes out [15].

In a preceding research, both clinical nurses and pregnant women wanted to know how to make decisions and how to do prenatal care after receiving a shocking result of prenatal tests [16]. Like this, when mothers and their families feel confused or ask for help from nurses in relation to ethical issues, the nurses should be equipped with systematic and various qualifications for discussing and counseling ethical issues related to childbirth, meanings of life, value of life, issue of disabilities, and women's rights & pursuit of happiness. It is also urgently needed to have the measures for strengthening the counseling competency of clinical nurses [16].

Especially, the nurses need to be equipped with critical thinking ability regarding the wellbeing of fetus, fetus' right of equality as the disabled, and mothers' autonomy, in the process of helping mothers' decision-making related to genetic test [17]. Generally, total four principles are regarded as important in medical ethics, including respect for autonomy, non-maleficence, beneficence, and justice [18]. In case of applying those four ethical principles to maternal care after the abnormal prenatal tests, the following three concrete ethical considerations would be needed. Thus, the nurses should be equipped with an ability to deliver their perception and thinking directly or indirectly to mothers if necessary.

To provide more professional counseling considering all the wellbeing of fetus, a right of happiness, and mothers' autonomy after the result of prenatal tests, the nurses should be equipped with something more than medical knowledge. After deeply thinking about the value and meanings of life, they should reflect them into their occupation [18].

For this, more philosophical and critical curriculum needs to be strengthened. The needs for information the nurses showed in this study is accurately presenting the actual status and needs of the current genetic counseling of Korea. Both nursing educators and executives would need to design the contents of nursing education that defends both mother and fetus, suitable for the reality by carefully listening to the nurses' needs for information in this study [16].

This study explored and analyzed the nurses' subjective perception of prenatal tests by dividing it into two types. In the characteristics of each type, it was divided into 'Type of regarding the prenatal tests as important' in which they should approach mothers after perceiving the strengths and necessity of prenatal tests for mothers, and 'Type of defending subjects as a nurse' in which the nurses should respect the prenatal tests for mothers and their consequent choice, and also defend them in many different fields.

Considering the role of nurses as educators as women, research on this subjectivity will help transform our society's perception of prenatal tests. In addition, as a prospective medical person, it is expected to be used as basic data for the development of differentiated educational programs by presenting the subjective structure and characteristics of nursing college students' perception of prenatal tests.

Considering the recent introduction of the Act on Drug-Based Abortion in the Early Stage of Pregnancy, radical development of prenatal test techniques, and the Abortion Act of Korea, this study verified the important roles of professional nurses in case mothers should make rational decisions related to prenatal tests. In order for nurses to sensitively accept the newest information about prenatal tests, and also to be equipped with abilities to help mothers' autonomous decision-making related to prenatal tests, it would be necessary to continuously modify the contents of nursing subject suitable for the time. Also, to overcome the limitations to help mothers' decision-making related to prenatal tests they found the most difficult, the nurses should be able to respect mothers' values, and to frequently perceive and understand their own values and ethical principles for counseling with mothers. This study suggests to more strengthen an ability to systematically think about differences in various values of individuals and society, ethical consideration necessary for meaningful life, and ethical principles for mother and fetus among nurses' competencies.

In addition, prenatal examination is related to the ethical perspective of nurses. To resolve the ethical conflicts faced in the clinical field and make correct ethical decisions, the right ethical education must be located at the foundation. Therefore, ethical education to increase nurses' ethical decision-making confidence should not be simply delivered of ethical knowledge, but should be configured to actively perform nursing with social responsibilities stemming from the essence of nursing to protect the dignity of life, and should continue to change with the times.

By embodying bioethics regulations or guidelines within the nursing organization, a supportive system should be established to maintain the well-being of the subjects as moral actors and realize their value as professional nurses, rather than being swept away by the majority opinion or acting to protect peer faith.

However, this study was conducted targeting a single university, and did not consider the factors affecting the perception of prenatal tests for the selection of subjects, so it is limited to generalize the results of this study. Thus, a follow-up research would need to additionally verify the types by composing the Q-samples with diverse backgrounds.

## CONCLUSIONS

This study was attempted by applying the Q methodology to prepare basic data necessary to suggest changes in prenatal tests perception and nurses' approach direction through subjective data analyzed by exploring the subjective perception of prenatal tests. As a result of this study, it was classified into three factors. The types of prenatal tests recognized by nursing students were 'Type of regarding the strengths of prenatal tests as important' and 'Type of defending subjects as a nurse'.

This study provided basic data to prepare measures to improve attitudes and perceptions toward families of performed prenatal tests in the future by categorizing the subjectivity of nursing students' prenatal tests. Through this study, it is expected that an educational program that considers the characteristics of each type will be developed because the characteristics of nursing college students were analyzed, and characteristics were confirmed. In addition, we propose a further study on type analysis by selecting samples considering various factors and qualitative studies to identify various factors affecting the nursing of family subjects for prenatal tests.

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