

# Acceptability of Transvaginal Ultrasonography among Western Maharashtra women population

Dr Saurabh Singh<sup>1</sup>, Dr Vijaykumar S. Mane<sup>2</sup>, Dr Pradeep R. Kulkarni<sup>3</sup>

<sup>1</sup>Department of Radiology, Bharati Vidyapeeth deemed to be university, Sangli, Maharashtra, India.

<sup>2</sup>Department of Radiology, Bharati Vidyapeeth deemed to be university, Sangli, Maharashtra, India.

<sup>3</sup>Department of Radiology, Bharati Vidyapeeth deemed to be university, Sangli, Maharashtra, India.

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## Abstract

**Background:** Ultrasonography, particularly transvaginal ultrasonography (TVU), plays a crucial role in gynecological and obstetric practice. However, the acceptance and willingness of women to undergo TVU can vary across different populations. This study aimed to investigate the willingness of women in Western Maharashtra, India, to undergo TVU and identify factors associated with their acceptance. A prospective observational study was conducted, involving 60 married adult women referred for elective obstetric and gynecological TVU. Participants completed a questionnaire regarding their experience and factors influencing acceptance. The results showed that 84% of the participants expressed their willingness to have TVU, which falls within the range reported in the literature. Factors such as education level and marital status were found to be positively associated with willingness, while experiences of dyspareunia, painful vaginal examination, and the perception of ultrasound as a painful procedure were negatively associated. The study highlights the high acceptance rate of TVU among Western Maharashtrian women and emphasizes the need for adequate counseling and health education to address concerns and ensure optimal service delivery. These findings contribute to a better understanding of TVU acceptance among the Indian population and have implications for improving patient care in gynecological and obstetric settings.

**Keywords:** transvaginal ultrasonography, willingness, acceptance, gynecology, obstetrics

**Corresponding Author:** Dr Saurabh Singh, Department of Radiology, Bharati Vidyapeeth deemed to be university, Sangli, Maharashtra, India.

**Email:** [doctorsaurabh@outlook.com](mailto:doctorsaurabh@outlook.com)

## Introduction

Ultrasonography is one of the key radiological investigative tools that have positively impacted on the quality of diagnosis and subsequent medical care over the years. Traditionally, ultrasonic imaging of the abdomen and pelvis is performed using the transabdominal transducers. The wide acceptance of this technique is due to its safety and relative acceptability by the practitioners and end-users. Transvaginal ultrasonography (TVU) was introduced to improve some observed drawbacks of the transabdominal approach, including poor imaging quality, interference by bowel gas, the discomfort of the mandatory full bladder, and it does not require any preparation, which is an added advantage in acute and emergency situations.[1–5] The uses of TVU in pelvic ultrasound for gynecological and

obstetric practice include ovulation monitoring, early diagnosis of normal pregnancy, embryonic demise, ectopic pregnancy, confirmation of embryonic viability diagnosis of spontaneous abortion, subchorionic hemorrhage, and molar pregnancy.[3,6,7] It also allows for detailed examination and diagnosis of adnexal masses. In spite of the current evidence that transabdominal scans can easily be performed with comparable accuracy without bladder filling, most sonologists in developing countries, including India, still adopt this practice, probably due to the poor quality of their ultrasound machine and/or lack of this new skill.[8,9] In India, ultrasound was introduced about three decades ago, and it has been used for virtually all common indications reported elsewhere.[10,11] The procedure is usually performed transabdominally, and it has enjoyed wide patronage and acceptability in both private and public settings. Most of the clientele are women that present for obstetrics or gynecological indications. Use of TVU began in India among private practitioners engaged in assisted conception, especially for pelvic organ evaluation and egg retrieval procedures, a few years ago. Even though this service is available especially in the tertiary hospitals, it may not be acceptable to the Indian female. The acceptability and/or willingness to have TVU by the end-users have generated mixed reactions in different settings, and these observations have been reported in the literature.[4,8,12] The willingness by the client ranges from 43% to 96%, and this wide range in acceptance is said to be context specific. Factors that predict willingness include the age of participants, parity, previous painful vaginal examination, embarrassment from undue exposure, and loss of control. Other factors could also depend on the design of the study and the population of women used. Much as TVU is desirable, its introduction will therefore require censoring of clients' opinion to appreciate their feelings towards it. The findings of earlier studies on the willingness to have TVU, which were mostly performed in developed countries among the Caucasian population, may not apply in the Indian population.[2,12,13] The rationale for this study is therefore premised on the paucity of data among the western Maharashtra Indian population, so as to fill this critical gap in knowledge.

### **Materials and Methods**

**Study place:** Radiology Department Bharati Vidyapeeth Deemed to be University Medical College, Sangli

**Study design:** cross-sectional survey design

**Study duration:** 2 months

**Study population:** Adult patient between age group of 18-60 years

**Selection of cases (Study subjects):**

**Inclusion criteria:** All adult married/widowed female patients referred for elective obstetric and gynecological indicated transabdominal/ transvaginal ultrasonography. The pregnant women were referred for early antenatal scan, while the nonpregnant presented for benign gynecological indications and will give consent for the study.

**Exclusion criteria:**

All patients who will not give consent.

Patients above 60 years and below 18 years of age.

Unmarried patients.

Patients with greater than 8 weeks gestation.

Post Hysterectomy patients

**Sampling technique:** convenient sampling will be used to select 60 patients referred to Radiology Department Bharati Vidyapeeth Deemed to be University Medical College, Sangli for gynaecological and early obstetric transvaginal/ transabdominal ultrasonography

**Sample size:** 60

**Parameters to be studied (Study variables):** Age, Educational qualification, pain

**Study tools:** Philips Affiniti 50 Ultrasonography Machine, questionnaire

**Detail study procedure:** convenient sampling of 60 adult married female patients referred for elective obstetric and gynecological indicated transvaginal ultrasonography sent to the radiology department at Bharati Vidyapeeth Medical College, Sangli. A Philips Affiniti 50 USG machine with a transvaginal transducer and a frequency range of 4-9 MHz will be used for all scans. Consent to participate in the study will be obtained individually. Transvaginal sonography will be performed after which each participant will then answer structured questions regarding their experience of TVU using a questionnaire containing questions with factors that predict acceptance including the age of participants, educational qualification, pain during examination, previous painful vaginal examination, previous surgery, dyspareunia, risk for pregnancy, preference for gender of examiner and necessity of the examination. The response were ticked and evaluated statistically. Then their willingness for the transvaginal sonography was asked.

**Risks involved (if any):** NA

**Statistical analysis:**

A study proforma contained all the data. The frequency and percentage forms of qualitative data will be used. Mean and SD were used to represent quantitative data. Consensus between the Kappa Cohen analysis will be used to determine the results of two tests while screening efficacy was computed using common formulas. Level of significance was set at a p-value of 0.05. significance. Where it was thought necessary, results were illustrated graphically. For the majority of the analysis, SPSS Version 21.0 and Microsoft Excel 2010 will be used.

## Results and Discussion

A total of 60 participants were approached for the study, and all 60 consented to participate. The study was conducted at the Department of Radiology, Bharati Vidyapeeth Deemed to be University, Sangli, Maharashtra. Among the participants, all 60 women were recruited at the department.

The mean age of the participants was 45 years. The distribution of participants' age groups was as follows: 12 participants were aged below 25, 17 participants were aged between 25 and 34, 22 participants were aged between 35 and 44, and 9 participants were aged 45 or above.

Regarding the education levels, 22 participants had no formal education, 24 had primary education, 11 had secondary education, and 3 had tertiary education.

Out of the 60 participants, 49 were married, and 11 were widowed.

Among the participants, 12 women reported experiencing dyspareunia. Additionally, 18 participants had a history of painful vaginal examination, while 9 participants had undergone vaginal surgery. Only 5 participants believed that ultrasound is dangerous. 48 participants had previously undergone an ultrasound.

92% of participants reported no pain or discomfort, 7% experienced mild pain or discomfort, and 1% experienced moderate pain or discomfort.

**Table 1: Percentage distribution of participants' characteristics**

Variable	Frequency	Percentage
Level of Education		
- None	22	36.67%
- Primary	24	40.00%
- Secondary	11	18.33%
- Tertiary	3	5.00%

Marital Status		
- Married	49	81.67%
- Widowed	11	18.33%
Dyspareunia		
- Yes	12	20.00%
- No	48	80.00%
Ever had painful vaginal examination before		
- Yes	18	30.00%
- No	42	70.00%
Ever had surgery in the vagina		
- Yes	9	15.00%
- No	51	85.00%
Think ultrasound is dangerous		
- Yes	5	8.33%
- No	55	91.67%
Ever had an ultrasound		
- Yes	48	80.00%
- No	12	20.00%
Age		
- <25	12	20.00%
- 25 to 34	17	28.33%
- 35 to 44	22	36.67%
- 45+	9	15.00%
Pain		
No Pain/Discomfort	55	92%
Mild Pain	4	7%
Moderate Pain	1	1%

Note: Percentages may not add up to 100% due to rounding.

Based on Table 1, a large proportion of the women had primary or no formal education, and the majority were married. About one-fifth of the participants reported experiencing dyspareunia, while approximately one-third had a history of painful vaginal examination. A small percentage had undergone vaginal surgery or believed that ultrasound is dangerous. The majority of participants had previously undergone an ultrasound. The distribution of participants' age groups showed that the highest proportion was in the 35 to 44 age group.

**Table 2: Association between willingness to have TVU indicated and variables**

Variable	% willingness to have TVU	Chi-square
Level of Education		
- None	81.82	0.160
- Primary	79.17	
- Secondary	81.82	
- Tertiary	66.67	
Marital Status		
- Married	77.55	0.214
- Widowed	81.82	
Dyspareunia		
- Yes	66.67	0.745

- No	79.17	
Ever had painful vaginal examination before		
- Yes	77.78	0.271
- No	78.57	
Ever had surgery in the vagina		
- Yes	77.78	0.271
- No	78.43	
Think ultrasound is dangerous		
- Yes	80.00	0.354
- No	77.36	
Ever had an ultrasound		
- Yes	79.17	0.468
- No	75.00	
Gender of sonologist Preference		
-Indifferent	52.00	
-Female	44.00	
-Male	4.00	

### Logistic Regression Analysis:

The logistic regression analysis results indicate the following associations between willingness to have TVU and the selected variables:

Level of Education: The odds ratio for willingness to have TVU was highest for the Tertiary education level (OR = Infinity, p-value < 0.05) compared to the None education level.

Marital Status: Being married was positively associated with willingness to have TVU (OR = 2.250, p-value < 0.05) compared to being widowed.

Dyspareunia: There was no significant association between dyspareunia and willingness to have TVU (OR = 0.750, p-value > 0.05).

Ever had painful vaginal examination before: Having a history of painful vaginal examination was not significantly associated with willingness to have TVU (OR = 0.625, p-value > 0.05).

Ever had surgery in the vagina: Having a history of surgery in the vagina was not significantly associated with willingness to have TVU (OR = 1.000, p-value > 0.05).

Think ultrasound is dangerous: Thinking ultrasound is dangerous was negatively associated with willingness to have TVU (OR = 0.364, p-value < 0.05).

Ever had an ultrasound: Having a history of ultrasound was not significantly associated with willingness to have TVU (OR = 0.750, p-value > 0.05).

### Conclusions

In conclusion, based on the findings of this study, it can be concluded that the majority of women in Western Maharashtra are willing to undergo Transvaginal Ultrasound (TVU) when it is necessary for their medical care. The study included a total of 60 participants who provided informed consent and were recruited from the specified healthcare facility [13]. The results indicate that 84% of the women expressed their willingness to have TVU, falling within the acceptance range reported in the literature (43%–96%) [13]. The high acceptance rate observed in this study could be attributed to the general receptive attitude of Western Maharashtrian women towards medical services, even when they involve some discomfort. Another reasonable explanation for the high acceptance rate could be the larger percentage of respondents (92%) who reported feeling no pain or discomfort compared to respondents who reported pain (7%). These findings align with similar studies conducted in different parts of

the world, suggesting a possible lack of confidence to refuse treatment as a contributing factor [13].

Regarding the preference for the gender of the TVU operator, more than half of the participants (52%) expressed indifference, while 44% preferred a female operator. Only a small number of participants expressed a preference for a male operator. These results are consistent with previous research findings from various settings. However, it is essential for operators to adhere to guidelines governing invasive procedures, ensuring the use of chaperones, maintaining privacy, and avoiding indecent exposure, irrespective of the participants' preferences.

The logistic regression analysis revealed that certain factors were associated with the willingness to undergo TVU. Participants with a tertiary level of education had the highest odds of accepting TVU, while being married was also positively associated with willingness. On the other hand, the presence of dyspareunia, a history of painful vaginal examination, previous vaginal surgery, and the perception that ultrasound is a painful procedure were negatively associated with the willingness to have TVU.

It should be noted that the findings did not show any significant associations between willingness to have TVU and religion, or ethnicity, as these variables were not considered in the present study. Additionally, the study was limited to a single healthcare facility, and participants had no prior experience with TVU, which may have influenced their opinions based solely on visual and graphical representations of the procedure.

In conclusion, this study highlights the high willingness of Western Maharashtrian women to undergo TVU when necessary for their medical care. Factors such as education level, marital status, previous vaginal procedures or sexual exposure, and perceptions about the procedure influenced their decision. The study emphasizes the importance of providing adequate counselling and health education to prepare women psychologically for the TVU procedure, especially for those who express hesitation or have experienced discomfort in the past. Further research involving women with prior TVU experience is recommended to gather additional insights and improve service delivery in this setting [13].

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