

Relationship Between Ultrasound Viewing and Proceeding to Abortion

Mary Gatter, MD, Katrina Kimport, PhD, Diana Greene Foster, PhD, Tracy A. Weitz, PhD, MPA, and Ushma D. Upadhyay, PhD, MPH

OBJECTIVE: Ultrasound scanning is a routine part of preprocedure abortion care, and many health care providers offer patients the opportunity to view their ultrasound images. It has been speculated that ultrasound viewing will dissuade women from having an abortion. We examine whether viewing the image is associated with choosing to continue the pregnancy.

METHODS: Data from medical records for 15,575 visits by women seeking abortion care at a large, urban abortion provider in 2011 were analyzed for factors associated with choosing to continue the pregnancy. All patients received a preprocedure ultrasound scan and were offered the opportunity to view the image.

RESULTS: Patients opted to view the ultrasound image 42.5% of the time. Nearly all pregnancies (98.8%) were terminated: 98.4% of pregnancies among women who viewed their ultrasound images and 99.0% of pregnancies among the patients who did not. Among women with high decision certainty, viewing was not associated with deciding to continue the pregnancy. Viewing was significantly associated with deciding to continue the pregnancy only among the 7.4% of women who reported medium or low decision certainty about having an abortion (adjusted odds ratio 3.21, 95% confidence interval 1.18–8.73).

CONCLUSION: Voluntarily viewing the ultrasound image may contribute to a small proportion of women with medium or low decision certainty deciding to continue the pregnancy; such viewing does not alter decisions of the large majority of women who are certain that abortion is the right decision.

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LEVEL OF EVIDENCE: II

Little research has investigated the effects, if any, of women viewing their preabortion ultrasound images. Ultrasound scanning is a routine part of abortion care,^{1–3} although it is not necessarily medically required.^{2,4,5} Research on wanted pregnancies has found that viewing the ultrasound image facilitates maternal–fetal bonding,^{6,7} leading two physicians to speculate in an editorial that ultrasound viewing may dissuade women from abortion.⁸ However, existing research suggests that women’s decision certainty about having the abortion, rather than the abortion experience itself, is a predictor of outcomes, including postabortion emotional difficulty^{9–11} and sensitivity to protester presence.¹² Two studies, from South Africa and Canada, found that ultrasound viewing had no effect on women’s decision to continue or terminate their pregnancies.^{13,14} These studies may have been underpowered (n=350 and 500) to detect an effect of viewing on abortion decisions if the effect size of ultrasound viewing was small. We add to this small body of research an analysis of the effect of voluntary ultrasound viewing in the United States, drawing on a substantially larger sample than previous studies.

We analyzed the deidentified medical records of more than 15,000 patients who sought abortion care at Planned Parenthood Los Angeles, a large, urban abortion provider in southern California, to see if a woman’s decision to view or not view her ultrasound image was associated with a decision to continue the pregnancy. In a previously published

From Planned Parenthood Los Angeles, Los Angeles, California; *Advancing New Standards in Reproductive Health*, Bixby Center for Global Reproductive Health, and the Department of Obstetrics, Gynecology & Reproductive Science, University of California, San Francisco, San Francisco, California.

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Corresponding author: Katrina Kimport, PhD, ANSIRH, UCSF, 1330 Broadway, Suite 1100, Oakland, CA 94612; e-mail: kimportk@obgyn.ucsf.edu.

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analysis of these data examining predictors of choosing to view, we found that women chose to view 42.5% of the time. Identifying as nonwhite, being younger than age 25 years, being at or below the federal poverty level, and having medium or low decision certainty about the abortion were significantly associated with increased odds of viewing.¹⁵

MATERIALS AND METHODS

We analyzed deidentified, abstracted data from the electronic medical records for all abortion care visits for the calendar year 2011 at Planned Parenthood Los Angeles. Planned Parenthood Los Angeles is a large, urban abortion provider with 19 clinical sites. This study was approved by the Committee on Human Research at the University of California, San Francisco. Because we used abstracted, deidentified data from patient records, we were not required to receive informed consent.

All patients received a preprocedure ultrasound scan at each appointment. As part of completing the initial clinical intake paperwork, patients were asked about viewing their ultrasound images. The question was not scripted, but the medical assistants all received the same training and tended to pose the question similarly: “Do you want to see your ultrasound picture on the screen as the clinician performs the examination?” The patient’s response was recorded in their electronic medical record in a yes or no checkbox format. The clinician performing the ultrasound scan also confirmed the patient’s viewing decision. In the event that the patient changed her mind or her decision was not already recorded, the clinician recorded it. Clinic protocol required that this response be completed for all abortion patient visits at all sites. Because we were interested in the pregnancy as the unit of analysis, for women who had multiple (between two and four) visits for a single pregnancy, we assessed whether the woman chose to view her ultrasound image at any visit for that pregnancy.

Records additionally included date of care; location where care was received; patient’s age, race or ethnicity, poverty level (0–100%, 100–200%, and 200%+ of the federal poverty level), pregnancy history, and gestational age (as assessed through ultrasonography, grouped into the categories less than 9 weeks, 9–12 weeks, 13–16 weeks, 17–19 weeks, and 20–24 weeks); the presence of multiple gestations; type of abortion (aspiration or surgical, or medication), if any, the patient received; and patient’s decision certainty about having an abortion (hereafter shortened to “decision certainty”). Decision certainty was assessed and categorized by clinic staff from the

patient’s verbal response to the question “How do you feel about your decision [to have an abortion]?” into the following categories: confident and clear about her decision (labeled “high decision certainty”); sad, angry, afraid, or ambivalent but clear about her decision (labeled “medium decision certainty”); confused, conflicted, or undecided about her decision; or did not want to have an abortion. As a result of small samples ($n=45$; $n=1$), the latter two categories were combined to form a “low decision certainty” category for the subsequent analyses. Records without a recorded decision certainty were categorized as “missing.”

The primary outcome of interest was a dichotomous variable: whether the woman decided to proceed with the abortion or continue the pregnancy. Although some patients explicitly stated that they planned to continue the pregnancy, others left because of temporary or remediable medical conditions (eg, desired deep sedation but did not have an escorted ride home) and did not return. For this analysis, we conservatively assumed that any patients who left without receiving an abortion and did not return continued their pregnancies. For pregnancies with multiple visits, we used the outcome of the final visit. We followed up with chart review into the first 8 weeks of 2012 to assess outcomes of patients who presented for an abortion in late 2011 but did not receive an abortion at that visit.

We excluded records for patients who were ineligible for abortion care (eg, were not pregnant, were over the gestational limit of the facility). We also excluded visits for a second procedure after a failed abortion, because they were considered repeat procedures. Because each pregnancy involves unique circumstances and distinct decisions,¹⁶ abortions sought for multiple pregnancies by the same woman over the course of the year were treated as separate observations. Nonetheless, we accounted for the possibility that a woman’s viewing decisions for multiple pregnancies may not be independent by using mixed-effects models that included clustering by woman.

We first described the sociodemographic and pregnancy-related characteristics of the sample and the proportion of each group electing to view their ultrasound images. Mixed-effects logistic regression models that accounted for clustering within clinical site and multiple pregnancies within women were used for all bivariate and multivariable models. We used mixed-effects logistic regression to assess group differences in binary variables, mixed-effects multinomial logistic regression for categorical variables, and mixed-effects ordinal logistic regression for ordered



categorical variables, including all variables that previous analyses of the data have shown are significantly associated with viewing.¹⁵ We present *P* values from Wald χ^2 tests to show group differences. Next, we examined the prevalence of continuing pregnancy by whether patients viewed the ultrasound image. We further explored this association by stratifying women by decision certainty and examining the prevalence of continuing the pregnancy within each certainty group, shown in Figure 1.

We then used multivariable regression models to examine the effect of ultrasound viewing on the likelihood of continuing the pregnancy using a block modeling approach to observe the differential effects of each variable or group of variables added to the model. As a result of low counts, we combined medium and low decision certainty into a single category for these models. In model 1, we examined the unadjusted association between ultrasound viewing and pregnancy continuation; in model 2, we added decision certainty; and in model 3, we added sociodemographic characteristics, gestational age, and multiple gestations as controls. In model 4, we tested a potential interaction between decision certainty and ultrasound viewing. In all analyses, the pregnancy was the unit of analysis. Statistical significance was set at $P < .05$ for all comparisons. Adjusted odds ratios and 95% confidence intervals (CIs) are reported. All statistical analyses were performed using STATA 12.

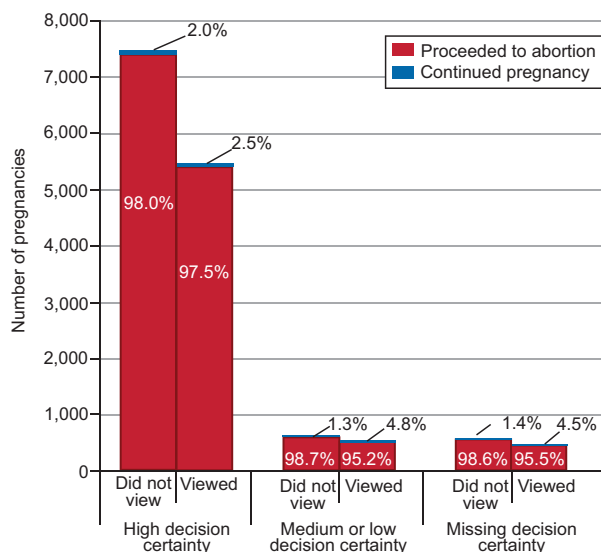


Fig. 1. Number of pregnancies that proceeded to abortion by decision certainty and viewing choice.

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RESULTS

We excluded 20 repeat abortions for women with ongoing pregnancies after failed abortion and 170 pregnancies that were ineligible for abortion care (eg, the women were not pregnant or were over the gestational limit of the facility). Our final sample included 15,575 visits for 15,168 pregnancies. Most women had only one pregnancy over the course of the year; 461 had more than one.

Table 1 details the characteristics of the patient population and the characteristics most associated with choosing to view the ultrasound image. Patients ranged in age from 12 to 48 years old with the largest number of patients between ages 20 and 24 years. Nearly half of the patients were Hispanic, more than three fourths (77.5%) were at or below the federal poverty level, and more than two thirds (67.9%) had been pregnant previously. Gestational age ranged from 3 to 24 weeks. The vast majority of women (85.4%) were certain about their decision to have an abortion, but 7.4% expressed medium or low decision certainty. Compared with those who did not view, women who viewed their ultrasound images were more likely to be younger, African American, have higher levels of poverty, and have had no previous pregnancy ($P < .001$ for all comparisons). Women who viewed were also more likely to have medium or low decision certainty ($P < .03$) and to select medication abortion ($P < .001$). A substantial minority of patients (42.5%) opted to view their ultrasound images.

A total of 98.8% of the pregnancies ended in abortion; among pregnancies in which the woman viewed the ultrasound image, 98.4% ended in abortion compared with 99.0% when the woman did not view her ultrasound image ($P < .001$). When stratified by level of decision certainty, rates of terminating the pregnancy did not vary among women who did not view their ultrasound images, but women with medium or low decision certainty who viewed had a slightly lower rate of proceeding to abortion than did those with high decision certainty who viewed (95.2% compared with 97.5%; Fig. 1).

Table 2 shows the multivariable analysis of the odds of continuing the pregnancy. Model 1, the unadjusted model, shows that ever viewing the ultrasound image was associated with higher odds (odds ratio [OR] 1.70, 95% CI 1.27–2.29) of continuing the pregnancy. Model 2 shows that the increased odds of continuation among patients ever viewing their ultrasound images persisted when controlling for decision certainty (adjusted OR 1.70, 95% CI 1.26–2.29). Model 3 shows that the increased odds persisted after controlling for decision certainty, age, race, poverty level, gestational



Table 1. Characteristics of Women in Study Sample, Unit of Analysis: Pregnancies

Characteristic	Overall (N=15,168)	Did Not View Ultrasound Image (n=8,718)	Viewed Ultrasound Image (n=6,450)	P
Age (y)				
Younger than 20	2,502 (16.5)	1,106 (12.7)	1,396 (21.6)	<.001
20–24	5,686 (37.5)	3,132 (35.9)	2,554 (39.6)	
25–29	3,681 (24.3)	2,282 (26.2)	1,399 (21.7)	
30–34	1,926 (12.7)	1,259 (14.4)	667 (10.3)	
35–39	983 (6.5)	666 (7.6)	317 (4.9)	
40 or older	390 (2.6)	273 (3.1)	117 (1.8)	
Race or ethnicity				
White	2,587 (17.1)	1,625 (18.6)	962 (14.9)	<.001
African American	2,451 (16.2)	1,188 (13.6)	1,263 (19.6)	
Hispanic	7,557 (49.8)	4,489 (51.5)	3,068 (47.6)	
Asian or Pacific Islander	966 (6.4)	500 (5.7)	466 (7.2)	
Other or unknown	1,607 (10.6)	916 (10.5)	691 (10.7)	
Poverty level (%)				
0–100	11,756 (77.5)	6,538 (75.0)	5,218 (80.9)	<.001
101–200	2,309 (15.2)	1,463 (16.8)	846 (13.1)	
201 and over	1,103 (7.3)	717 (8.2)	386 (6.0)	
Gravidity				
First pregnancy	4,838 (31.9)	2,498 (28.7)	2,340 (36.3)	<.001
Had previous pregnancy	10,306 (67.9)	6,202 (71.1)	4,104 (63.6)	
Missing	24 (0.2)	18 (0.2)	6 (0.1)	
Gestational age (wk)				
Up to 9	10,138 (66.8)	5,728 (65.7)	4,410 (68.4)	.480
9–12	3,028 (20.0)	1,796 (20.6)	1,232 (19.1)	
13–16	1,138 (7.5)	693 (7.9)	445 (7.9)	
17–19	446 (2.9)	257 (2.9)	189 (2.9)	
20–24	418 (2.8)	244 (2.8)	174 (2.7)	
Decision certainty				
High	12,959 (85.4)	7,491 (85.9)	5,468 (84.8)	.030
Medium or low	1,121 (7.4)	594 (6.8)	527 (8.2)	
Missing	1,088 (7.2)	633 (7.3)	455 (7.1)	
Outcome				
Aspiration or surgical abortion	10,206 (67.3)	6,065 (69.6)	4,141 (64.2)	<.001
Medication abortion	4,775 (31.5)	2,570 (29.5)	2,205 (34.2)	
Continued pregnancy	187 (1.2)	83 (1.0)	104 (1.6)	

Data are n (%) unless otherwise specified.

Percentages may not add up to 100% owing to rounding.

age, and multiple gestations (adjusted OR 1.78, 95% CI 1.31–2.42), although several of these variables had larger effects on the odds of continuing the pregnancy than ultrasound viewing, including decision certainty and gestational age.

To further examine the apparent relationship among decision certainty, viewing, and continuing the pregnancy, we included an interaction term for decision certainty and ultrasound viewing, shown in model 4. The interaction between viewing and the medium or low decision certainty category was significant (adjusted OR 3.21, 95% CI 1.18–8.73, $P=.022$). Among women reporting high decision certainty, viewing the ultrasound image was not associated with continuing the pregnancy; ie, they were not

more likely to continue the pregnancy after viewing the ultrasound image. The effect of viewing on women's decision to have an abortion was significant only among women who had medium or low decision certainty. Gestational age remained significant with the inclusion of the interaction variable and continued to have a larger effect on the adjusted odds of continuing a pregnancy: women at 17–19 weeks of gestation, for example, were almost 20 times as likely to continue the pregnancy compared with women at less than 9 weeks of gestation (95% CI 10.91–36.31).

DISCUSSION

Most women presenting for abortion care in our sample had high decision certainty, and ultrasound



Table 2. Multivariable Analysis With Mixed Effects of Continuing a Pregnancy in Study Sample (n=15,168)

Variable	Model 1* OR (95% CI)	Model 2* Adjusted OR (95% CI)	Model 3* Adjusted OR (95% CI)	Model 4 Adjusted OR (95% CI)
Ever saw ultrasound image	1.70 [†] (1.27–2.29)	1.70 [†] (1.26–2.29)	1.78 [†] (1.31–2.42)	1.37 (0.97–1.93)
Decision certainty				
High [†]		1.00	1.00	1.00
Medium or low		2.30 [†] (1.47–3.61)	2.13 [§] (1.35–3.36)	1.03 (0.44–2.41)
Missing		1.98 (1.12–3.51)	2.27 [§] (1.27–4.07)	0.79 (0.24–2.57)
Age (y)				
Younger than 20			1.11 (0.67–1.81)	1.12 (0.69–1.84)
20–24			1.17 (0.77–1.78)	1.17 (0.77–1.78)
25–29 [†]			1.00	1.00
30–34			2.16 [§] (1.34–3.48)	2.15 [§] (1.33–3.48)
35–39			0.89 (0.40–1.94)	0.89 (0.41–1.95)
40 or older			0.85 (0.26–2.85)	0.87 (0.26–2.90)
Race or ethnicity				
White [†]			1.00	1.00
African American			1.22 (0.72–2.07)	1.24 (0.73–2.11)
Hispanic			0.98 (0.61–1.56)	0.98 (0.61–1.56)
Asian or Pacific Islander			0.71 (0.31–1.60)	0.71 (0.31–1.60)
Other or unknown			0.83 (0.44–1.55)	0.82 (0.44–1.55)
Poverty level (%)				
0–100			1.15 (0.58–2.29)	1.15 (0.58–2.29)
101–200			1.21 (0.56–2.59)	1.20 (0.56–2.59)
201 and over			1.00	1.00
Gestational age (wk)				
Up to 9 [†]			1.00	1.00
9–12			5.32 [†] (3.39–8.08)	5.21 [†] (3.37–8.05)
13–16			13.12 [†] (8.10–21.25)	13.18 [†] (8.14–21.36)
17–19			19.76 [†] (10.85–36.00)	19.90 [†] (10.91–36.31)
20–24			15.32* (8.08–29.05)	15.29* (8.05–29.03)
Multiple gestations				
No [†]			1.00	1.00
Yes			2.74 (1.07–7.02)	2.76 (1.08–7.09)
Interaction variables				
Did not view, high certainty				1.00
Did not view, medium or low certainty				1.00
Did not view, unknown certainty				1.00
Viewed, high certainty				1.00
Viewed, medium or low certainty				3.21 (1.18–8.73)
Viewed, unknown certainty				5.38 (1.42–20.28)

OR, odds ratio; CI, confidence interval.

* Only a subset of the variables were entered into models 1, 2, and 3 to observe the differential effects of each variable or group of variables added to the model.

† $P < .001$.

‡ The patients in this category served as the reference group.

§ $P < .010$.|| $P < .050$.

viewing had no effect on their abortion decision. Unlike the two existing studies on the effect of ultrasound viewing,^{13,14} our analyses show that voluntary viewing was associated with some women's decisions to continue the pregnancy. However, the effect was very small—and should be considered with caution¹⁷—and limited to the 7% of patients with medium or low decision certainty. This population may not have been substantially present in

prior studies drawing on much smaller samples of patients.

The role of ultrasound viewing in abortion care needs to be contextualized. In the highly politicized field of abortion care,^{18,19} opponents of abortion have promulgated the idea that the majority of women will opt to continue a pregnancy once they view their ultrasound images.²⁰ In our study, however, 98.4% of patients proceeded to termination after viewing.



From both a health care and a policy perspective, it is important to understand the role that ultrasound viewing may play in women's decisions. It is equally important not to overstate its effect above other factors women use to make an abortion decision.²¹

Other factors had stronger effects on the likelihood of continuing a pregnancy. The increase in odds of continuing the pregnancy associated with each category of gestational age after 9 weeks compared with pregnancies less than 9 weeks of gestation suggests that women's comfort terminating their pregnancies decreases as gestation advances. This is consistent with findings that women's attachment to pregnancy is linearly associated with gestational age.²² We surmise that the deviation of the 20–24 weeks of gestation category from this pattern of increase owed to the inclusion of pregnancies with diagnosed fetal anomalies in this group. Such pregnancies are unlikely to be continued regardless of maternal attachment. The importance of gestational age for women deciding to continue the pregnancy suggests that it is the information the ultrasound scan renders—ie, gestational dating—rather than the image that influences women's decision-making.

This study has several limitations. Although we categorized women in this sample who did not receive an abortion as choosing to continue their pregnancy, we cannot verify that they carried the pregnancy to term. Some may have sought abortion care elsewhere or miscarried, obviating the need to return for care if they did not want to continue the pregnancy. Our data also do not allow us to measure other effects of viewing, for example, whether it helped some women confirm the decision to have an abortion.²³ Additionally, we were missing data on the decision certainty for 1,088 (7.2%) patient visits. Missing on decision certainty was associated with a greater likelihood of continuing pregnancy, suggesting that these values are likely not missing at random.

Finally, these results cannot be generalized to women's experience of ultrasound viewing in settings where it is mandatory, although given the very high percentage of women proceeding with abortion after viewing the ultrasound image, it is unlikely that mandatory viewing would substantially affect the number of abortions performed. It may, however, affect patient satisfaction and health outcomes, which research shows are enhanced when patients feel control over decisions related to their care.^{24–26} Mandating that women view their ultrasound images may have negative psychological and physical effects even on women who wish to view.

The clinical implications of this study are twofold. First, women should be offered the opportunity to

voluntarily view their ultrasound images before abortion. However, because fewer than half of women select this option, mandatory viewing should be avoided. Second, health care providers engaged in ultrasound viewing should be sensitive to how patients react to their images but avoid making assumptions about the effect of viewing on patient decision-making. Patients with low decisional certainty about the abortion decision may need more time and support in reaching a decision about whether abortion is the correct decision for them.

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