

# UC Berkeley

## UC Berkeley Previously Published Works

### Title

Quality of prenatal and postpartum telehealth visits during COVID-19 and preferences for future care.

### Permalink

<https://escholarship.org/uc/item/52256096>

### Journal

AJOG global reports, 3(1)

### ISSN

2666-5778

### Authors

Marshall, Cassondra  
Gutierrez, Sirena  
Hecht, Hannah  
et al.

### Publication Date

2023-02-01

### DOI

10.1016/j.xagr.2022.100139

Peer reviewed

# Quality of prenatal and postpartum telehealth visits during COVID-19 and preferences for future care



Cassandra Marshall, DrPH, MPH; Sirena Gutierrez, MPH; Hannah Hecht, MPH; Rachel Logan, PhD, MPH; Jennifer Kerns, MD, MPH; Nadia Diamond-Smith, PhD, MS

**BACKGROUND:** At the start of the COVID-19 pandemic, telehealth practices for pregnancy-related care were rapidly implemented. Telehealth for pregnancy-related care is likely to continue after the pandemic. In order for health systems and clinicians to provide person-centered pregnancy-related care via telehealth, it is critical to understand patients' telehealth experiences and their preferences regarding the use of telehealth moving forward.

**OBJECTIVE:** This study aimed to describe perceived quality of prenatal and postpartum telehealth visits during COVID-19 and to examine the association between telehealth quality during the pandemic and future telehealth preferences.

**STUDY DESIGN:** We used data from an online sample of US women aged 18 to 45 years seeking reproductive health care during COVID-19. Two cross-sections of survey data were collected in July 2020 and January 2021. This analysis included those who sought prenatal (n=1496) or postpartum (n=482) care during the pandemic. Among those who had a prenatal or postpartum telehealth visit, we used multivariable logistic regression to examine the association between a measure of perceived telehealth quality and openness to future telehealth visits, adjusting for sociodemographic characteristics.

**RESULTS:** A total of 57.5% of prenatal and 52.9% of postpartum respondents had a telehealth appointment. Respondents agreed with most statements about the quality of their telehealth appointments, with  $\geq 80\%$  reporting that they were convenient, easy, safe, and provided good information. Lower-ranked quality items were related to visits feeling personal and the patient feeling cared for. A total of 35.2% of prenatal (n=816) and 43.3% of postpartum (n=231) respondents expressed openness to telehealth visits in the future. Prenatal and postpartum respondents reporting higher telehealth quality had increased odds of being open to telehealth in the future (prenatal: adjusted odds ratio, 1.2; 95% confidence interval, 1.2–1.3; postpartum: adjusted odds ratio, 1.2; 95% confidence interval, 1.1–1.3).

**CONCLUSION:** Prenatal and postpartum respondents with better telehealth experiences were more likely to express openness to telehealth in the future, although most preferred future in-person visits. As pregnancy-related telehealth continues, it is important to offer appointment options that match patient preferences, especially populations that face barriers in access to care, and to explore ways to personalize care and support positive patient–provider relationships.

**Key words:** antenatal care, COVID-19, pandemic, patient-centered care, perinatal care, provider–patient relationships, telemedicine, virtual care

## Introduction

The COVID-19 pandemic drastically affected the delivery of pregnancy-

related care in the United States. Before the pandemic, telehealth or virtual models of care, including phone and

video visits, were not typically used for prenatal or postpartum care,<sup>1</sup> with one study of women enrolled in large

From the School of Public Health, University of California, Berkeley, Berkeley, CA (Dr Marshall and Ms Hecht); Department of Epidemiology and Biostatistics, University of California, San Francisco, San Francisco, CA (Ms Gutierrez and Dr Diamond-Smith); Department of Family and Community Medicine, Person-Centered Reproductive Health Program, University of California, San Francisco, San Francisco, CA (Dr Logan); Department of Obstetrics, Gynecology and Reproductive Sciences, University of California, San Francisco, San Francisco, CA (Dr Kerns).

Received June 13, 2022; revised November 18, 2022; accepted November 22, 2022.

The authors report no conflict of interest.

The Commonwealth Fund (grant number: 20213165), Stan and Mary Friedman, the University of California, San Francisco (UCSF) Chancellor's Fund, and the Department of Epidemiology and Biostatistics at UCSF provided financial support for this study. Dr. Marshall received support from the National Institutes of Health/National Institute on Minority Health and Health Disparities (NIH/NIMHD, K01MD016169, PI: Marshall). The sponsors had no involvement in the study design, collection, analysis, interpretation of data, writing of the report, or the decision to submit the report for publication. Patient consent was not required because no personal information or details were included.

**Cite this article as:** Marshall C, Gutierrez S, Hecht H, et al. Quality of prenatal and postpartum telehealth visits during COVID-19 and preferences for future care. *Am J Obstet Gynecol Glob Rep* 2023;3:100139.

Corresponding author: Cassandra Marshall, DrPH, MPH [cassiejm@berkeley.edu](mailto:cassiejm@berkeley.edu)

2666-5778/\$36.00

© 2022 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)  
<http://dx.doi.org/10.1016/j.xagr.2022.100139>

## AJOG Global Reports at a Glance

**Why was this study conducted?**

At the start of the COVID-19 pandemic, telehealth practices for pregnancy-related care were rapidly implemented. Using data from an online sample of US women, we described the perceived quality of prenatal and postpartum telehealth visits during COVID-19 and examined the association between telehealth quality during the pandemic and future telehealth preferences.

**Key findings**

Overall, respondents reported high levels of telehealth quality. Nearly two-thirds of prenatal respondents and approximately half of postpartum respondents expressed a preference for in-person visits in the future. Those with better telehealth experiences were more likely to express openness to telehealth in the future.

**What does this add to what is known?**

As pregnancy-related telehealth continues, it is important to offer appointment options that align with the needs and preferences of patients.

responded to the survey indicating they were women, but acknowledge that people other than women can become pregnant and/or give birth. The survey took between 5 and 10 minutes to complete. A detailed description of our survey methodology can be found elsewhere.<sup>12</sup> This analysis used data from women who reported that they were pregnant and had sought prenatal care or had given birth in the last 3 months (ie, postpartum women) and had received postpartum care. Those with missing data on telehealth use were excluded (pregnant: n=156, 9.5%; postpartum: n=32, 6.2%). This study was approved by the University of California, San Francisco Institutional Review Board.

**Measures**

Telehealth was defined as having a prenatal or postpartum appointment “over the phone,” “over video,” and/or “online/over chat.” Respondents could report >1 type of visit.

The primary outcome of interest was expressed openness to telehealth, referring to whether women reported not wanting all future (ie, after the COVID-19 pandemic) visits to be in-person. This was only determined for women who reported having prenatal or postpartum telehealth visits during the COVID-19 pandemic.

The main predictor of interest was a composite measure of perceived telehealth quality including seven questions about convenience, ease of use, feeling personal, safe, private, cared for, and receiving good and understandable information. Answer options were a 4-point Likert scale of strongly agree to strongly disagree. A dichotomous variable for each was created for agree (strongly agree and agree) and disagree (strongly disagree and disagree). In addition, a summary score was created, with each item having a score from 1 to 4 (1=strongly disagree and 4=strongly agree), for a total score ranging from 7 to 28 (28 being the highest ranking for quality of care).

Sociodemographic variables contained in the survey and used for analysis included: age (18–24, 25–34, or ≥35 years), educational attainment (less than

employer plans finding that <1% of visits were delivered via telemedicine.<sup>2</sup> At the start of the pandemic, telehealth practices for pregnancy-related care were rapidly implemented, and several studies in various patient populations and geographic locations in the United States noted substantial increases in the proportion of prenatal care visits delivered virtually.<sup>3,4</sup> For example, one study found that 81.3% of pregnant women in the second and third trimesters transitioned from in-person to virtual visits between May and November of 2020,<sup>5</sup> whereas another reported an increase in average weekly virtual prenatal visits from 11% from December 2019 to March 2020, to 43% from March to June 2020.<sup>6</sup>

Telehealth for pregnancy-related care is likely to continue after the pandemic. Before the pandemic, The American College of Obstetricians and Gynecologists (ACOG) supported telehealth as an opportunity to enhance obstetrical care.<sup>7</sup> In May of 2020, ACOG affirmed that expanded access to telehealth should be considered for “broad-scale and long-term implementation” beyond the pandemic.<sup>8</sup> Research suggests that telehealth for pregnancy-related care may enhance patient satisfaction and improve patient engagement.<sup>7,9–11</sup>

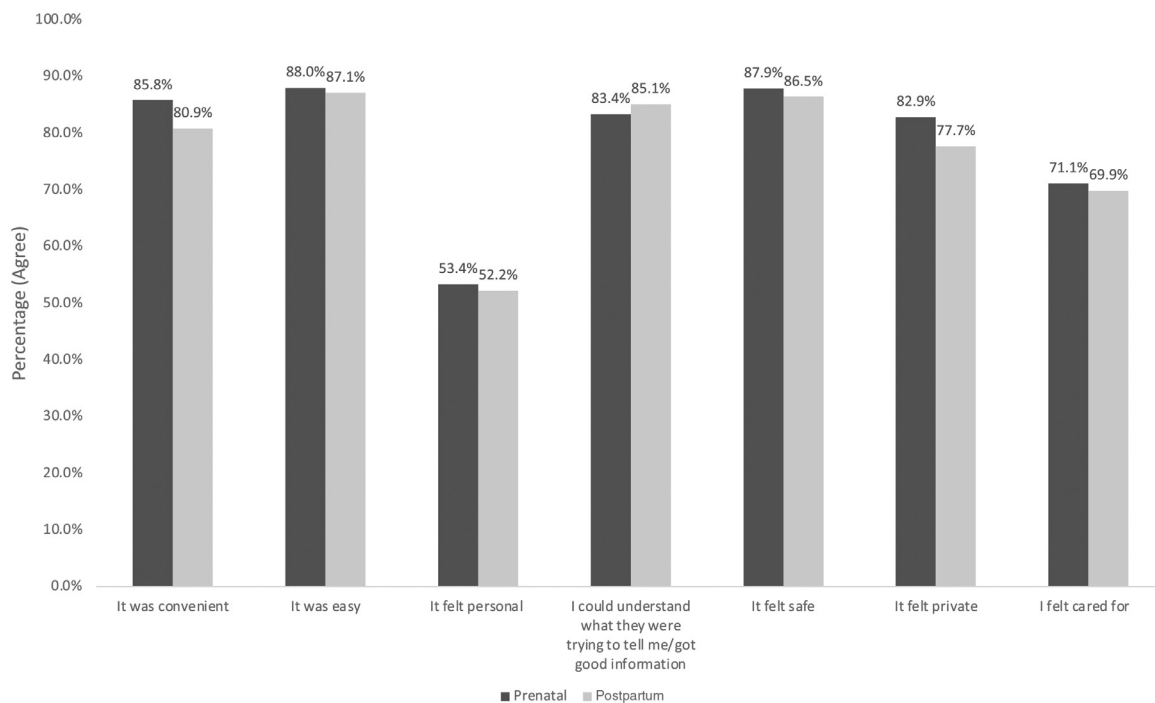
In order for health systems and clinicians to provide person-centered

pregnancy-related care via telehealth, it is critical to understand patients’ telehealth experiences during the pandemic and their preferences regarding the use of telehealth moving forward. We used data from an online sample of US women seeking reproductive health care during the COVID-19 pandemic to describe the perceived quality of telehealth prenatal and postpartum visits and patients’ preferences for future telehealth care provision. We examined the association between telehealth quality during the pandemic and openness to telehealth in the future.

**Materials and Methods**

The data presented here are part of a larger study on the experiences of women in the United States seeking contraception, prenatal, postpartum, miscarriage, and abortion care during COVID-19. Using Facebook and Instagram advertisements, we recruited a sample of self-identified women aged 18 to 45 years at 2 time points during the pandemic: July 2020 (1 week) and January 2021 (2 weeks). Women were invited to participate in a survey via an advertisement. Those who clicked the link were provided an informed consent page and eligibility questions. Eligibility included identifying as a woman and being aged 18 to 45 years. We note that our sample included people who

**FIGURE**  
**Perceived telehealth quality among prenatal and postpartum respondents**



Marshall. Prenatal and postpartum telehealth quality. *Am J Obstet Gynecol Glob Rep* 2022.

high school or high school, some college, or college or more), health insurance (none, private, or public), cohabitation status (cohabitating with a partner or not cohabitating), number of children (none or  $\geq 1$ ), US region (West, Midwest, Southwest, Southeast, or Northeast, derived from zip codes<sup>13</sup>), and race and ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, or none of the above). The “None of the above” category included the following racial and ethnic response options from the survey: Alaska Native, Asian, Native American, Pacific Islander, “Other,” and those reporting mixed race or multiracial identities. In addition, a COVID-19 hardship score was created by summing together 3 questions related to the impact of COVID-19 on reported loss of job, income, or housing at the time of the survey, with higher scores reflecting greater hardship owing to COVID-19. The COVID-19 hardship score was examined as a categorical (0/1/2/3) and continuous variable.

### Analysis

We combined data from both survey data collection periods (ie, July 2020

and January 2021) for the analysis to create 2 groups: pregnant and postpartum women. We used descriptive statistics to describe the participant characteristics and the independent and dependent variables. We used chi-square tests of independence to examine differences between those who did and did not have a telehealth appointment by sociodemographic characteristics. We used analysis of variance (ANOVA), the Student *t* test, and Pearson correlation to examine differences in telehealth quality by sociodemographic characteristics. We used chi-square tests of independence and ANOVA to examine differences between those who did and did not express openness to telehealth in the future by sociodemographic characteristics. We used multivariable logistic regression to examine the association between the continuous measure of telehealth quality and openness to telehealth for future care, adjusted for all sociodemographic variables described above to account for potential confounders, time of survey (July 2020 or January 2021), and differences by time.

We assessed for an interaction effect by COVID-19 hardship using cross-product terms in the regression models; results were not statistically significant, and thus main-effects models are presented. All analyses were conducted separately for prenatal and postpartum women. All *P* values  $<.05$  were considered significant. We performed statistical analyses using Stata, version 16 (StataCorp LLC, College Station, TX).

### Results

In January 2021, 83% of people who clicked the link that appeared in their Facebook feed completed the survey; in July 2020, 32% of people who clicked completed the survey (average completion rate, 57.5%). A total of 1496 pregnant and 482 postpartum women answered questions about their use of telehealth. Most respondents were aged 25 to 34 years (prenatal: 66.3%; postpartum: 62.9%), non-Hispanic White (prenatal: 64.0%; postpartum: 58.1%), had a college education (prenatal: 54.3%; postpartum: 58.3%), and had private insurance (prenatal: 62.0%; postpartum: 64.0%) (Table 1). Approximately 60%

**TABLE 1**  
**Baseline characteristics of participants by type of prenatal (n=1496) and postpartum (n=482) appointment**

Characteristic	Prenatal				Postpartum			
	Total (n=1496)		Had a virtual appointment (n=860)	Did not have a virtual appointment (n=636)	Total (n=482)		Had a virtual appointment (n=255)	Did not have a virtual appointment (n=227)
% N	100%				100%			
	N	%	%	%	N	%	%	%
Type of virtual appointment								
Over the phone			67.3	NA			60.0	NA
Over video			49.7	NA			46.7	NA
Online/over chat			18.0	NA			12.2	NA
Race/ethnicity <sup>a</sup>								
Hispanic/Latina	197	13.4	61.4	38.6	78	16.9	57.7	42.3
Non-Hispanic Black	117	8.0	65.8	34.2	43	9.3	67.4	32.6
Non-Hispanic White	939	64.0	54.6	45.4	269	58.1	48.0	52.0
None of the above	215	14.7	62.3	37.7	73	15.8	57.5	42.5
Age (y) <sup>a</sup>								
18–24	221	14.8	48.0	52.0	59	12.2	47.5	52.5
25–34	992	66.3	58.1	41.9	303	62.9	54.8	45.2
35–45	283	18.9	62.9	37.1	120	24.9	50.8	49.2
Education <sup>a</sup>								
High school or less	231	15.5	55.0	45.0	93	19.9	55.9	44.1
Some college	449	30.2	53.2	46.8	102	21.8	53.9	46.1
College or more	807	54.3	60.6	39.4	273	58.3	50.9	49.1
Insurance type								
None	43	2.9	53.5	46.5	25	5.3	52.0	48.0
Public	520	35.1	56.7	43.3	144	30.7	55.6	44.4
Private	920	62.0	57.9	42.1	300	64.0	51.7	48.3
Cohabitation status								
Cohabiting	1357	91.4	57.7	42.3	425	90.6	52.5	47.5
Other	127	8.6	54.3	45.7	44	9.4	56.8	43.2
Parity								
No children	567	38.2	59.6	40.4	7	1.5	85.7	14.3
Any children	916	61.8	56.2	43.8	456	98.5	51.5	48.5
United States Region <sup>a,b</sup>								
West	372	25.5	68.3	31.7	109	23.7	62.4	37.6
Midwest	323	22.2	51.7	48.3	112	24.4	49.1	50.9
Southwest	185	12.7	49.2	50.8	63	13.7	55.6	44.4
Southeast	399	27.4	48.6	51.4	122	26.5	41.8	58.2
Northeast	178	12.2	69.7	30.3	54	11.7	59.3	40.7

(continued)

TABLE 1

Baseline characteristics of participants by type of prenatal (n=1496) and postpartum (n=482) appointment (continued)

Characteristic	Prenatal			Postpartum		
	Total (n=1496)	Had a virtual appointment (n=860)	Did not have a virtual appointment (n=636)	Total (n=482)	Had a virtual appointment (n=255)	Did not have a virtual appointment (n=227)
COVID-19 hardship score <sup>a,b</sup>						
0	607	40.8	53.5	239	50.5	49.8
1	443	29.8	57.8	127	26.9	52.8
2	336	22.6	64.9	68	14.4	60.3
3	103	6.9	55.3	39	8.3	74.4

Data obtained from participants who completed the first or second round of surveys.

NA, not applicable.

<sup>a</sup> $P < .05$  for across-group differences by survey round for prenatal appointment;<sup>b</sup> $P < .05$  for across-group differences by survey round for postpartum appointment;Marshall. Prenatal and postpartum telehealth quality. *Am J Obstet Gynecol Glob Rep* 2022.

of prenatal respondents and 50% of postpartum respondents reported some level of COVID-19 hardship.

Overall, 57.5% (N=860) of prenatal respondents had a telehealth appointment (Table 1). Of those, most had phone visits (67.3%), approximately half had video visits (49.7%), and 18% had online/chat visits. Results were similar for postpartum respondents; approximately half (52.9%) reported telehealth appointments, with 60% being by phone, almost half by video, and approximately 12% by online/chat. A greater proportion of Hispanic/Latina (prenatal: 61.4%; postpartum: 57.7%), non-Hispanic Black (prenatal: 65.8%; postpartum: 67.4%), and respondents categorized as “None of the above” race/ethnicity (prenatal: 62.3%; postpartum: 57.5%) reported virtual appointments compared with non-Hispanic White respondents (prenatal: 54.6%; postpartum: 48.0%), although this was statistically significant for prenatal participants only ( $P < .05$ ). For prenatal participants, those with virtual appointments were also older, more educated, and reported less COVID-19 hardship than those who had in-person appointments ( $P < .05$ ). Postpartum respondents with less COVID-19 hardship were also more likely to report virtual appointments than those reporting greater hardship ( $P < .05$ ).

Overall, prenatal respondents reported high levels of agreement with most statements related to the quality of their

telehealth appointments (Figure), with >80% stating that it was convenient, easy, provided good information, and felt safe and private. Approximately 71% reported feeling cared for, and only 53.4% that the appointments felt personal. A similar trend emerged for postpartum respondents, with slightly lower scores overall; the lowest scores were observed for feeling cared for and for the appointments feeling personal (Figure). Overall, on a 28-point scale with 28 being the highest (best) quality score, prenatal respondents had a mean score of 20.7 (standard deviation [SD], 4.3) and postnatal respondents of 20.4 (SD, 4.5) (Table 2). For both groups, older women, those more educated, and those with private insurance (only prenatal) reported higher scores ( $P < .05$ ), and those with more COVID-19 hardship reported lower scores ( $P < .05$ ).

Among those who had telehealth visits, a little over a third (35.2%) of prenatal respondents and less than half (43.3%) of postpartum respondents expressed openness to telehealth visits in the future (Table 3). Table 3 presents the proportion of respondents who expressed openness to telehealth visits in the future by respondent characteristics. In multivariable models, prenatal respondents who reported higher telehealth quality had increased odds of being open to telehealth in the future (adjusted odds ratio [aOR], 1.21; 95% confidence interval [CI], 1.16–1.27) (Table 3). A higher COVID-19

hardship score and the survey time period of January 2021 (vs July 2020) were also significantly associated with more openness to telehealth in the future in prenatal respondents. Hispanic/Latina prenatal respondents had lower odds (aOR, 0.51; 95% CI, 0.30–0.87) of openness to telehealth. A higher telehealth quality score was similarly associated with increased odds of openness to future telehealth for postpartum respondents (aOR, 1.18; 95% CI, 1.10–1.27) (Table 3). No other socio-demographic characteristics were associated with openness to telehealth among postpartum respondents.

### Comment Principal findings

In this analysis of nearly 2000 women accessing prenatal and postpartum care during the COVID-19 pandemic, we found that over half reported receiving their care via telehealth. Nearly two-thirds of prenatal respondents and close to half of postpartum respondents expressed a preference for in-person visits in the future. Overall, respondents reported high levels of telehealth quality, and those with better telehealth experiences were more likely to express openness to telehealth in the future.

### Results in the context of what is known

Most women in our study desired in-person visits in the future, which is

**TABLE 2**  
**Characteristics of participants with a prenatal (n=816) and postpartum (n=231) telehealth visit by telehealth quality score**

Characteristics	Telehealth quality score Mean±standard deviation	
	Prenatal	Postpartum
Overall	20.7±4.3	20.4±4.5
Race/ethnicity		
Hispanic/Latina	20.0±4.7	20.0±5.1
Non-Hispanic Black	21.1±3.1	21.2±6.2
Non-Hispanic White	20.9±4.3	20.6±4.1
None of the above	20.5±4.0	20.2±4.3
Age (y) <sup>a,b</sup>		
18–24	19.1±4.5	18.7±3.1
25–34	20.8±3.9	20.3±4.6
35–45	21.5±4.9	21.5±4.7
Education <sup>a,b</sup>		
High school or less	20.1±5.4	19.3±3.9
Some college	20.0±4.3	19.3±6.3
College or more	21.2±3.9	21.3±3.6
Insurance type <sup>a</sup>		
None	19.9±3.6	20.3±4.8
Public	19.8±4.9	19.9±4.9
Private	21.3±3.8	20.7±4.3
Cohabitation status		
Cohabiting	20.8±4.2	20.3±4.6
Other	19.8±4.5	21.7±4.0
Parity		
No children	20.7±4.3	18.2±2.0
Any children	20.7±4.3	20.5±4.6
United States Region		
West	20.5±4.5	20.2±4.2
Midwest	30.0±4.0	20.4±4.9
Southwest	30.0±3.6	20.4±4.4
Southeast	20.4±4.5	20.3±5.4
Northeast	21.0±4.2	21.3±3.3
COVID-19 hardship score <sup>a,b,c</sup>	−0.0812	−0.1668

<sup>a</sup>*P*<.05 for prenatal appointment;

<sup>b</sup>*P*<.05 for postpartum appointment;

<sup>c</sup>Pearson correlation coefficient.

Marshall. Prenatal and postpartum telehealth quality. *Am J Obstet Gynecol Glob Rep* 2022.

consistent with some previous research examining preferences for telehealth. Before the pandemic, Peahl et al<sup>14</sup> found that only approximately a quarter of women would consider telemedicine as an alternative care model for most of their prenatal care visits. During the pandemic, some studies examining future pregnancy-related care preferences have found that most patients desire in-person care under nonpandemic conditions,<sup>5</sup> whereas others have observed high levels of interest in future telehealth.<sup>15,16</sup>

Overall, most women in our study reported high levels of agreement with statements related to the quality of their telehealth appointments. Other studies have noted high satisfaction with telehealth among pregnant patients during the pandemic,<sup>4,15</sup> and Peahl et al<sup>6</sup> found that most patients felt that virtual prenatal visits were easy and as safe as in-person visits. Notably, we found that the lower-ranked quality items were about the visit feeling personal and the patient feeling cared for, suggesting that the more relational aspects of care may be more challenging for telehealth visits compared with other dimensions of care such as ease and provision of clear information. Our findings are in line with Sullivan et al,<sup>16</sup> who found that negative aspects of virtual prenatal care included patients not feeling a strong provider connection and a feeling of not receiving the same provider attention as during in-person visits.

We found that a higher proportion of Black, Hispanic, and other racially and ethnically minoritized respondents reported telehealth visits compared with non-Hispanic White respondents; this was true for both prenatal and postpartum respondents. Although many studies have found that racial and ethnic minorities have been less likely to report telehealth use during the COVID-19 pandemic,<sup>17</sup> other studies have noted higher use of telehealth in these populations.<sup>18–20</sup>

### Clinical and research implications

Our findings have important implications for future care delivery and research. As pregnancy-related

**TABLE 3****Association of perceived telehealth quality and openness to telehealth in the future among those who had a telehealth prenatal (n=816) and telehealth postpartum appointment (n=231)**

	Prenatal (n=816)		Postpartum (n=231)	
	Unadjusted proportion (%)	Adjusted OR (95% CI)	Unadjusted proportion (%)	Adjusted OR (95% CI)
Total	35.2		43.3	
Telehealth quality score (cont.) <sup>a,b,c</sup>	22.4±3.9	1.21 (1.16–1.27) <sup>d</sup>	21.8±4.9	1.18 (1.10–1.27) <sup>d</sup>
<b>Race/ethnicity</b>				
Non-Hispanic White	35.8	Ref	42.4	Ref
Hispanic/Latina	24.8	0.51 (0.30–0.87) <sup>d</sup>	42.9	0.77 (0.31–1.93)
Non-Hispanic Black	42.2	1.07 (0.59–1.93)	54.6	1.15 (0.38–3.49)
None of the above	35.7	1.07 (0.69–1.67)	42.9	1.01 (0.45–2.27)
<b>Age (y)</b>				
18–24	29.4	Ref	37.5	Ref
25–34	33.8	1.01 (0.59–1.73)	42.6	1.92 (0.59–6.23)
35–45	40.7	1.33 (0.71–2.49)	49.2	2.20 (0.63–7.67)
<b>Education<sup>b</sup></b>				
High school or less	36.9	Ref	53.3	Ref
Some college	40.8	1.48 (0.87–2.51)	43.4	0.55 (0.21–1.43)
College or more	31.1	0.92 (0.53–1.60)	40.6	0.38 (0.15–1.01)
<b>Insurance type</b>				
None	30.4	Ref	46.2	Ref
Public	39.9	1.27 (0.45–3.54)	43.2	1.54 (0.38–6.23)
Private	32.0	1.02 (0.36–2.93)	43.8	2.46 (0.57–10.72)
COVID-19 hardship score (cont.) <sup>a,b</sup>	1.2 ± 0.9	1.23 (1.01–1.49)	1.0 ± 1.1	1.25 (0.88–1.78)
<b>Cohabitation status</b>				
Cohabiting	34.4	0.82 (0.44–1.51)	42.6	1.44 (0.47–4.42)
Other	37.9	Ref	54.6	Ref
<b>Parity</b>				
No children	32.0	Ref	66.7	Ref
Any children	36.5	1.11 (0.79–1.56)	43.1	0.28 (0.04–1.90)
<b>United States Region</b>				
West	34.9	Ref	40.3	Ref
Midwest	35.9	1.09 (0.69–1.73)	35.9	0.83 (0.35–1.95)
Southwest	36.8	0.88 (0.50–1.54)	48.6	1.42 (0.56–3.55)
Southeast	35.8	0.79 (0.50–1.24)	50.0	1.29 (0.54–3.06)
Northeast	29.2	0.66 (0.39–1.12)	50.0	1.27 (0.48–3.31)

(continued)



TABLE 3

**Association of perceived telehealth quality and openness to telehealth in the future among those who had a telehealth prenatal (n=816) and telehealth postpartum appointment (n=231) (continued)**

	Prenatal (n=816)		Postpartum (n=231)	
	Unadjusted proportion (%)	Adjusted OR (95% CI)	Unadjusted proportion (%)	Adjusted OR (95% CI)
Survey time <sup>b,c</sup>				
January 2021	50.3	2.38 (1.59–3.55) <sup>d</sup>	54.3	1.69 (0.82–3.47)
July 2020	29.7	Ref	38.0	Ref

CI, confidence interval; cont., continuous variable; OR, odds ratio; Ref, reference group.

<sup>a</sup>Mean±standard deviation;

<sup>b</sup>P<.05 for across-group differences for prenatal appointment;

<sup>c</sup>P<.05 for across-group differences for postpartum appointment;

<sup>d</sup>Statistically significant (P<.05).

Marshall. Prenatal and postpartum telehealth quality. *Am J Obstet Gynecol Glob Rep* 2022.

telehealth continues, it is important to offer prenatal and postpartum appointment options that match the needs and preferences of patients, especially populations that disproportionately face barriers in access to care.<sup>14</sup> Further investigation of preferences regarding the modality of virtual visits (eg, phone/audio only, video) and the type of appointment (eg, virtual for postpartum or prenatal) should be prioritized. Additional research is needed to interpret our finding of racial and ethnic differences in telehealth visits, including a better understanding of which populations are more likely to be offered various types of telehealth visits for pregnancy-related care. We also encourage further research into our finding that prenatal patients with increased COVID-19 hardship were more open to telehealth in the future; one possibility is that telehealth is perceived as more accessible than in-person care. Finally, our findings also suggest that clinicians and health systems should consider strategies to better personalize telehealth and support the development of positive patient–provider relationships during telehealth visits.

### Strengths and limitations

The strengths of this study are its large sample with geographic variation in the United States and the ability to measure multiple dimensions of quality regarding a growing and prevalent

phenomenon in a time of rapid change and crisis. There are also limitations. Despite the overall large sample size, a smaller number of women had recently given birth or were currently pregnant; thus, we combined the samples from the 2 time periods in which we collected data and were unable to explore changes over time in detail. Our measure of future preferences was somewhat broad given that it involved all future care and lacked specificity about prenatal and postpartum care. In addition, we lacked data on whether those reporting a telehealth visit had a choice between in-person and telehealth visits. Furthermore, our quality measure included only women who had a telehealth visit, and we did not have information about telehealth preferences among women who had not had a telehealth visit. We also lacked data on whether women had high-risk pregnancies or health issues that may have influenced their preferences. Finally, there are certain biases in our sampling approach using Facebook, which have been discussed elsewhere.<sup>20</sup> Although our findings cannot be generalized to the whole United States population, other studies recruiting over Facebook have found the populations to be representative of the desired demographic.<sup>21</sup>

### Conclusions

Unsurprisingly, more than half of prenatal and postpartum women in our United States-based sample reported

having a telehealth appointment for their pregnancy-related care during the COVID-19 pandemic. Our findings indicate that most women reported high levels of agreement with many statements related to the quality of their telehealth appointments, but that there is an opportunity for health systems and clinicians to better address the relational aspects of care delivery via telehealth. Furthermore, our findings suggest that the quality of telehealth visits experienced by patients during the pandemic influences future preferences for care delivery. Although most expressed a preference for in-person visits after the pandemic, women with better telehealth experiences during the pandemic were more open to future telehealth. As we move forward and aspects of virtual care persist, future work must align models of prenatal and postpartum care with the preferences of diverse patient populations to help ensure the provision of patient-centered and equitable care. ■

### REFERENCES

- Bradley D, Blaine A, Shah N, Mehrotra A, Gupta R, Wolfberg A. Patient experience of obstetric care during the COVID-19 pandemic: preliminary results from a recurring national survey. *J Patient Exp* 2020;7:653–6.
- Weigel G, Frederiksen B. Feb 26 URP. Telemedicine and pregnancy care. KFF. 2020. Available at: <https://www.kff.org/womens-health-policy/issue-brief/telemedicine-and->

pregnancy-care/. Accessed September 29, 2021.

**3.** Futterman I, Rosenfeld E, Toaff M, et al. Addressing disparities in prenatal care via telehealth during COVID-19: prenatal satisfaction survey in east Harlem. *Am J Perinatol* 2021;38:88–92.

**4.** Holcomb D, Faucher MA, Bouzid J, Quint-Bouzid M, Nelson DB, Duryea E. Patient perspectives on audio-only virtual prenatal visits amidst the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. *Obstet Gynecol* 2020;136:317–22.

**5.** Liu CH, Goyal D, Mittal L, Erdei C. Patient satisfaction with virtual-based prenatal care: implications after the COVID-19 pandemic. *Matern Child Health J* 2021;25:1735–43.

**6.** Peahl AF, Powell A, Berlin H, et al. Patient and provider perspectives of a new prenatal care model introduced in response to the coronavirus disease 2019 pandemic. *Am J Obstet Gynecol* 2021;224. 384.e1–11.

**7.** Implementing telehealth in practice. *Obstet Gynecol* 2020;135. e73–9.

**8.** The American College of Obstetricians and Gynecologists. Telehealth and remote patient monitoring for pregnant and postpartum women. 2020. Available at: <https://www.acog.org/advocacy/-/media/a211a70996ab47a28c3a0afdb43d2f86.ashx>. Accessed September 29, 2021.

**9.** Pflugeisen BM, Mou J. Patient satisfaction with virtual obstetric care. *Matern Child Health J* 2017;21:1544–51.

**10.** Pflugeisen BM, McCarren C, Poore S, Carille M, Schroeder R. Virtual visits: managing prenatal care with modern technology. *MCN Am J Matern Child Nurs* 2016;41:24–30.

**11.** Peahl AF, Smith RD, Moniz MH. Prenatal care redesign: creating flexible maternity care models through virtual care. *Am J Obstet Gynecol* 2020;223. 389.e1–10.

**12.** Diamond-Smith N, Logan R, Marshall C, et al. COVID-19's impact on contraception experiences: exacerbation of structural inequities in women's health. *Contraception* 2021;104:600–5.

**13.** National Geographic Society. United States regions. 2022. Available at: <https://education.nationalgeographic.org/resource/united-states-regions>. Accessed November 11, 2022.

**14.** Peahl AF, Novara A, Heisler M, Dalton VK, Moniz MH, Smith RD. Patient preferences for prenatal and postpartum care delivery: a survey of postpartum women. *Obstet Gynecol* 2020;135:1038–46.

**15.** Tozour JN, Bandremer S, Patberg E, et al. Application of telemedicine video visits in a maternal-fetal medicine practice at the epicenter of the COVID-19 pandemic. *Am J Obstet Gynecol MFM* 2021;3:100469.

**16.** Sullivan MW, Kanbergs AN, Burdette ER, et al. Acceptability of virtual prenatal care: thinking beyond the pandemic. *J Matern Fetal Neonatal Med* 2022;35:8472–5.

**17.** Hill BJ, Lock L, Anderson B. Racial and ethnic differences in family planning telehealth use during the onset of the COVID-19 response in Arkansas, Kansas, Missouri, and Oklahoma. *Contraception* 2021;104:262–4.

**18.** Campos-Castillo C, Anthony D. Racial and ethnic differences in self-reported telehealth use during the COVID-19 pandemic: a secondary analysis of a US survey of internet users from late March. *J Am Med Inform Assoc* 2021;28:119–25.

**19.** Reed ME, Huang J, Graetz I, et al. Patient characteristics associated with choosing a telemedicine visit vs office visit with the same primary care clinicians. *JAMA Netw Open* 2020;3: e205873.

**20.** Eberly LA, Kallan MJ, Julien HM, et al. Patient characteristics associated with telemedicine access for primary and specialty ambulatory care during the COVID-19 pandemic. *JAMA Netw Open* 2020;3:e2031640.

**21.** Whitaker C, Stevelink S, Fear N. The use of Facebook in recruiting participants for Health Research purposes: a systematic review. *J Med Internet Res* 2017;19:e290.