

PREGNANT WOMEN'S REPORTS OF THE **IMPACT OF COVID-19** ON Pregnancy, Prenatal Care, and Infant Feeding Plans

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Abstract

Purpose: The aim of this study is to describe how the COVID-19 (coronavirus) pandemic has affected pregnancy, prenatal maternity care practices, and infant feeding plans among pregnant persons in the United States.

Study Design: Cross-sectional descriptive study using an app-based survey.

Methods: A link to the survey was sent via email to users of the Ovia Pregnancy app on May 20, 2020 and was open for 1 week. Participants were asked to complete the survey as it applied to their pregnancy, breastfeeding, and maternity care received during the COVID-19 pandemic, beginning approximately February 2020 through the time of the survey. There were 258 respondents who completed the survey.

Results: The majority (96.4%; $n = 251$) of pregnant women felt they received safe prenatal care during this time period. Slightly less 86.3% ($n = 215$) felt they received adequate prenatal care during this time period. 14.2% ($n = 33$) reported changing or considering changing the location where they planned to give birth due to COVID-19. Of those who reported they had begun purchasing items for their baby, 52.7% reported that the COVID-19 pandemic has affected their ability to get items they need for their baby.

Clinical Implications: Although it is imperative to implement policies that reduce risk of transmission of COVID-19 to pregnant women and health care providers, it is necessary for health care providers and policy makers to listen to the collective voices of women during pregnancy about how COVID-19 has affected their birth and infant feeding plans and their perception of changes in prenatal care.

Key words: COVID-19; Pandemic; Pregnancy; Prenatal care; Survey.

In December of 2019, a novel coronavirus began to spread beginning in Wuhan, China. In the months following, the virus continued to spread rapidly throughout the world. The United States has the highest number of test-confirmed COVID-19 infections in the world and as of November 10, 2020, has reported over ten million cases and over 240,000 deaths (Johns Hopkins University, 2020). There are high rates of mortality among vulnerable populations who contract the virus (Dashraath et al., 2020). In the United States, Black, Brown, Indigenous, and other populations of color have been disproportionately affected by the virus (Dorn et al., 2020; Millett et al., 2020).

Historically, during other infectious disease outbreaks, such as SARS and H1N1, pregnant women have been considered at high risk and have experienced higher rates of morbidity and mortality (Dashraath et al., 2020). Physiologic and mechanical changes that occur in pregnancy, specifically cardiopulmonary changes, such as increased heart rate and stroke volume and reduced pulmonary residual capacity may result in increased risk of hypoxemia when faced with a respiratory infection. Immunologic changes that occur with advancing pregnancy may impair pathogen clearance resulting in increased severity of disease (Kourtis et al., 2014). Little was known about how SARS-CoV-2, the virus that causes COVID-19, would affect pregnancy or the clinical characteristics with which pregnant women would present (Breslin et al., 2020). Subsequently, with limited research to support decision making, professional societies, health care systems, and governmental agencies were tasked with creating policies to guide the care of pregnant women during the COVID-19 pandemic.

The most common symptoms of COVID-19 include fever, fatigue, and dry cough; however, shortness of breath, headache, loss of taste and/or smell, sore throat, congestion or runny nose, diarrhea, and nausea and vomiting are also listed as symptoms (Centers for Disease Control and Prevention [CDC], 2020a, 2020b). Physiologic changes that occur normally during pregnancy such as gestational rhinitis and physiologic dyspnea (due to increased maternal oxygen demands from heightened metabolism, gestational anemia, and fetal oxygen consumption) may mask COVID-19 symptomology (Dashraath et al., 2020). Those with COVID-19 may be asymptomatic yet can still transmit the virus. Early in the pandemic, Sutton et al. (2020) reported that 87.9% of those who were pregnant and positive at admission for labor and birth were asymptomatic; sparking conversations around the need for universal screening of pregnant women on admission for labor and birth as well as discussions on how to best protect pregnant women, their neonates, and the health care providers who care for them from the virus.

Due to concerns about spread of the virus to patients and health care workers, and lack of data on the effect of

the virus on pregnancy and the fetus, changes to prenatal and intrapartum care policies were quickly enacted. These policies significantly affected the delivery of health care services nationally, and altered prenatal care schedules and screening (Boelig, Manuck, et al., 2020; Boelig, Saccone, et al., 2020).

In both in- and outpatient health care settings, providers are required to observe strict guidelines, including appropriate donning and doffing of personal protective equipment (PPE), while caring for pregnant people in order to prevent viral spread (Chen et al., 2020; Dashraath et al., 2020). Due to shortages of PPE, and limited availability of COVID-19 testing, it became necessary for health care facilities to determine ways by which to preserve resources and prevent the spread of COVID-19. In response, frequency of prenatal and testing appointments decreased, with many appointments moved to virtual platforms such as phone calls and video chats, dramatically altering the health care experience and altering how patients interact with health care providers (Boelig, Saccone, et al., 2020). This has also affected the number of visitors and support people patients can have with them at outpatient offices, testing facilities and hospitals, and in some cases, visitation was banned all together.

Outside of articles by the lay press and on social media, to date, there has been limited research to amplify the voices of pregnant women about how they feel their pregnancy and prenatal care has been affected by the COVID-19 pandemic. A survey conducted in Northern Ireland found that pregnant women who were unable to have their partner present during doctor's appointments felt lonely, anxious, and unsupported (BirthWise, 2020), reinforcing how vital support people and partners are to maternal wellbeing. As partners and other support people are being excluded from appointments and even birth, pregnant women are changing their birth plans, including location and facility type, as well as breastfeeding plans (Allers, 2020a). There is conflicting information on breastfeeding intention as it relates to COVID-19. Changes to breastfeeding plans include reconsidering breastfeeding newborns because of separation of newborns in some cases from mothers despite no evidence to support this practice (Tran et al., 2020). Others have changed from formula feeding to breastfeeding due to shortages of formula (Allers, 2020b). The purpose of this survey was to explore how the pandemic and revised health care delivery have influenced prenatal decision making, access to supplies and education, and to better understand pregnant women's concerns about the safety and adequacy of the prenatal care received during the pandemic.

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Study Design and Methods

A cross-sectional descriptive research design was used to study the relationship between COVID-19 (corona-

Frequency of prenatal and testing appointments were altered, and many appointments moved to virtual platforms, dramatically altering the prenatal care experience.

virus) and pregnancy, prenatal maternity care practices and breastfeeding among pregnant persons in the United States. We aimed to explore whether those who were pregnant perceived their prenatal care to be safe and adequate during the initial outbreak of the COVID-19 pandemic, beginning March 2020. A questionnaire was designed, drawing upon areas of concern reported by pregnant women in the lay literature and from the authors' experiences with institutional changes occurring with prenatal care during this time period. The majority of survey questions were closed response to promote ease of response and analysis. However, open-ended responses were used to collect more detailed information. Open-ended responses were offered to allow respondents to report something different from the answer choices provided. The survey was reviewed by content experts in maternal child health to improve face validity. Institutional review board approval was granted by WellSpan Health.

The survey was created using Survey Monkey software and included a cover letter that outlined purpose of the study, provided contact information for the principal and coinvestigators, and met requirements for informed consent. Initial survey questions limited respondents to those who were currently pregnant, > 18 years of age, and were receiving prenatal care in the United States. A link to the survey was emailed to users of the mobile application, Ovia Pregnancy. The email was sent to 90,002 users on May 20, 2020 and was live for 1 week (May 27, 2020). The email was opened by 11,754 (13%) of those users, the link was clicked by 442 (4%), and the survey was completed by 258 (58% of those who clicked on the link). All data collected were anonymous. Participants were made aware that their participation in the survey was voluntary, that they could end their participation at any time, and that they need not answer all questions. Logic and a skip pattern were built into the survey such that participants who answered certain questions were not required to answer other, irrelevant questions. Typical time to completion of the survey was 6 minutes and 52 seconds.

Raw data were downloaded from Survey Monkey and analyzed in SPSS V.25. Mean and frequency data were reported. Subsample analysis was performed to assess safety and adequacy of prenatal care. Content analysis was performed by two of the authors (RB and SD) who reviewed written statements from participants who entered free text for the questions "why did you feel your prenatal care was not safe" and "why did you feel your prenatal care was inadequate." These text statements were uploaded into Atlas.Ti© and reviewed line by line. Open coding was used, and the codes were grouped by topic (Miles et al., 2014). This was an iterative process and trustworthiness of the data was discussed with the full research team (Lincoln & Guba, 1985). A matrix was created where the content analysis codes were grouped and categorized based on the number of participants who used the word or phrase (Miles et al.).

Results

Participant Characteristics

Survey respondents were receiving prenatal care in 44 different states. However, 51% of respondents came from nine states: New York (7.8%; *n* = 20), Texas (7.4%; *n* = 20), California (7%; *n* = 18), North Carolina (6.6%; *n* = 17), Pennsylvania (6.6%; *n* = 17), Florida (4.7%; *n* = 12), New Jersey (3.9%; *n* = 10), Illinois (3.5%; *n* = 9), and Iowa (3.5%; *n* = 9). The majority of respondents were White (82.9%; *n* = 214) and non-Hispanic (85.6%; *n* = 220). Mean age was 30.7 years (SD 4.3). Over 60% (61.5%; *n* = 158) had a bachelor's degree or higher. For most respondents, this was their first pregnancy (62%; *n* = 160; Table 1).

Planned Location to Give Birth

The majority reported being cared for by an obstetrician (81.3%; *n* = 208) and planning a hospital birth (92%;

TABLE 1. CHARACTERISTICS OF STUDY PARTICIPANTS (*N* = 258)

| Characteristic | M (SD) |
|-------------------------------------|--------------|
| Age (years) | 30.7 (4.3) |
| Gestational age (weeks) | 23.2 (10.7) |
| Minimum gestational age in weeks | 4 |
| Maximum gestational age in weeks | 40 |
| | <i>n</i> (%) |
| ≥24 weeks pregnant | 139 (53.9) |
| Hispanic ethnicity | 30 (11.6) |
| Race | |
| Black | 25 (9.7) |
| White | 214 (82.9) |
| Asian | 9 (3.5) |
| American Indian or Alaskan Native | 6 (2.3) |
| Decline to answer | 5 (1.9) |
| Other | 4 (1.6) |
| Native Hawaiian or Pacific Islander | 1 (0.4) |
| Married | 208 (80.9) |
| Education | |
| Bachelor's degree or higher | 158 (61.5) |
| Sees an OB/GYN for care | 208 (81.3) |
| Primiparous | 160 (62) |
| Tested for COVID during pregnancy | 12 (4.7) |
| Planned location to give birth | |
| Hospital | 220 (92) |
| Home | 4 (1.7) |
| Birth center | 15 (6.3) |

n = 220). However, 4.2% (n = 10) reported changing the location where they planned to give birth due to COVID-19 and another 10% (n = 23) said they were considering changing where they planned to give birth. Of the 10 women who reported changing their planned location for their birth, six said they now planned to give birth in their home, three others said they were planning to give birth at a different hospital from where they had planned, and one listed “other location.” Of those who now planned to give birth at home, five of the six reported making this choice out of the fear of being exposed to illness. Of those switching hospitals, one reported they switched because they said they were told to do so by their provider.

Visitation Policies

The majority (74.3%; n = 176) of survey respondents said their birth facility was allowing one support person with them during their labor and birth. Approximately 20% (n = 48) reported they did not know how many support persons were allowed to attend their birth, and 2.5% (n = 6) said that they would not be allowed to have any support people with them. Of those who were birthing in a facility and aware of their birth facilities policies, 17% (n = 29) did not agree with the policies enacted by the birth facility. When asked to elaborate as to why they did not agree with the visitation policies, several respondents listed that they felt the policies were overly restrictive and felt strongly doulas should be able to attend the birth as well.

Childbirth Education

Fifty percent of the respondents (n = 120) reported that they had planned to attend prepared childbirth classes prior to COVID-19. Seventy-five percent (n = 85) reported that their face-to-face childbirth classes were cancelled due

to COVID 19. Of those who planned to attend childbirth education, 54% (n = 60) reported they were offered online childbirth classes to replace the face-to-face classes they missed due to the pandemic. However, 93.2% (n = 110) stated that if given an option, they would have preferred face-to-face childbirth classes.

Safety and Adequacy of Prenatal Appointments

Reported safety and adequacy of care was based on participants’ perception of the prenatal care they received. Of those who reported they were far enough along gestationally to attend prenatal visits (n = 225), 32% (n = 72) had attended prenatal visits virtually. Over 60% (61.4%; n = 43) reported being satisfied or very satisfied with the virtual prenatal visits. However, 12.8% (n = 9) were either dissatisfied or very dissatisfied. The overwhelming majority (96.4%; n = 251) felt they received safe prenatal care during this time period. Slightly less 86.3% (n = 215) felt they received adequate prenatal care during this time period. The remaining 32 participants (12%) indicated that their care was either unsafe, inadequate, or both unsafe and inadequate. Of these 32 responses, 75% (n = 24) felt their care was safe but inadequate, 6.25% (n = 2) felt their care was unsafe but adequate, and 18.75% (n = 6) felt their care was both unsafe and inadequate.

Content Analysis. On review of open-ended responses on safety and adequacy of prenatal care, the overarching theme was quality of care with four sub-themes: prenatal appointment schedule, quality of provider interactions, availability of screening tests, and COVID-19 pandemic influence (Table 2). These sub-themes reflected main topics participants mentioned when describing why they felt their prenatal care was either unsafe or inadequate.

TABLE 2. CONTENT ANALYSIS OF SAFETY AND ADEQUACY OF PRENATAL CARE COMMENTS

| Subthemes | Words | Cases | Supporting Quotes | Safety or Adequacy Question |
|-----------------------------------|---|-------|---|-----------------------------|
| Prenatal Appointment Schedule | Appointment ¹ (40 mentions) | 21 | <i>I am not going to as many appointments as I thought I would be.</i> | Adequacy |
| Quality Provider Care Interaction | Doctor ² (22 mentions) | 15 | <i>Because I don't see the same doctor every time, they don't seem invested in me as a person.</i> | Both |
| | | | <i>And I can't go to my OBGYN as often as I should.</i> | Adequacy |
| Screening | Screening ³ (20 mentions) | 8 | <i>I have not been able to get a fetal MRI ordered by my perinatologist because of reduced and restricted scheduling.</i> | Adequacy |
| Covid-19 Pandemic Influence | COVID ⁴ (13 mentions) | 9 | <i>I have not seen a doctor since February due to pandemic.</i> | Adequacy |

Words Included

¹**Appointment**—Appointment, Appointments, Appt, Appts, Visit, Visits, and Cancelled

²**Doctor**—Doctor, Doctors, Doctor's, Dr, Provider, OB, OBGYN, Perinatologist, and Specialist

³**Screening**—Ultrasound, Scan, Fetal heart rate/beat, Blood pressure/work, Fetal MRI, and High risk

⁴**Covid**—Covid-19, pandemic, coronavirus

Twenty-one participants mentioned concerns about the interruption to their prenatal appointment schedule. Of these, most were related to appointments being cancelled or changed, and not being able to stay on their anticipated “schedule” of prenatal appointments. One participant from Missouri whose fetus was 19 weeks’ gestation wrote *Appointments are being cancelled. (It will be over 7 weeks in between my last and next appt (appointment)).* As per another participant from Texas at 22 weeks’ gestation, *(I) left the first practice because they decreased the number of overall visits and made remaining ones all virtual. It felt like no care at all.* Thirteen participants mentioned concerns about their provider’s care. Participants mentioned various frustrations with their providers and the information they received. One participant from Nevada at 22 weeks’ gestation stated *My providers are rushed and make errors. I receive different information depending on which OB I see. I feel like they are pre-occupied and not thorough in their care.*

Participants mentioned concern with screening during the prenatal period and not being able to receive ultrasounds, regular blood pressure screening nor being able to hear the fetal heartbeat. One participant from New Jersey noted *I personally feel as though going 12 weeks between appointments is unsafe and therefore made me nervous which was part of what elevated my blood pressure.* Nine participants used words related to COVID-19 despite not being prompted to in the questions. We thought it was important to group these together because this was not a section where participants were prompted to share their thoughts on the pandemic. One participant from Texas who was 10 weeks’ gestation reported *Covid-19 has affected interactions with nurses and doctors. It is weird.*

COVID-19

Approximately 30% ($n = 70$) reported that because of COVID-19 they had to change who will be attending and supporting them in labor and birth. Twelve (4.7%) participants reported being tested for COVID-19 during pregnancy. Of those, 11 tested negative and one had results pending at the time of the survey. Over 60% of respondents (63.2%; $n = 148$) believe the COVID-19 pandemic has affected their pregnancy. There was no significant association between gestational age and this belief ($p = 0.71$). When asked where they get most of their information about COVID-19 and its impact on pregnancy and breastfeeding, health care provider was the leading response (25.4%; $n = 59$) and CDC was second (21%; $n = 49$).

Infant Feeding Plan

Of those who said they had an infant feeding plan ($n = 192$), only six (3.1%) said their infant feeding plan has changed due to COVID-19, and another three (1.6%) said they are considering changing their feeding plan. Of the six who said they were changing their feeding plan, five said they were previously going to formula feed and are now going to give breast milk. When asked why they decided to change their feeding plan to breastfeeding, one respondent reported formula shortages, four said they



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believed that breast milk would better protect their baby from infection, one cited cost of formula, and one cited fear over formula contamination. Only one participant said they were previously going to breastfeed and are now going to formula feed and cited struggles with depression as what caused them to change their mind.

Ability to Obtain Items Needed for the Baby

Of those who reported they had begun purchasing items for their baby, 52.7% ($n = 88$) reported that the COVID-19 pandemic has affected their ability to get the items they need for their baby. Shortages of items (80.7%; $n = 71$) and cancelled baby showers (73.9%; $n = 65$) were listed as the leading reasons respondents were unable to get the items, they felt they needed to prepare for the arrival of their newborn (Table 3). Diapers (42%; $n = 37$)

TABLE 3. HOW HAS COVID-19 IMPACTED YOUR ABILITY TO GET THE ITEMS YOU NEED FOR YOUR BABY?

| | N = 88 |
|-------------------------------|---------------|
| | n (%) |
| Cancelled baby showers | 65 (73.9) |
| Shortages of items | 71 (80.7) |
| Lack of money | 26 (29.5) |
| Lack of transportation | 5 (5.7) |
| No stores open | 61 (69.3) |

TABLE 4. WHICH BABY ITEMS HAVE BEEN DIFFICULT TO OBTAIN?

| | <i>N</i> = 88 |
|------------------|---------------|
| | <i>n</i> (%) |
| Car seat | 20 (22.7) |
| Crib or bassinet | 25 (28.4) |
| Formula | 12 (13.6) |
| Diapers | 37 (42) |
| Baby wipes | 40 (45.4) |

and baby wipes (45.4%; *n* = 40) were listed as the most difficult items to obtain (Table 4). Participants listed longer shipping times, items being out of stock online, and not wanting to go out shopping for items for fear of their safety (getting sick). Other items respondents had trouble obtaining were baby clothes, strollers and nursery furniture (rockers or gliders and crib and bassinet mattresses), as they wanted to test them out before buying and found them difficult to order online.

Clinical Implications

As health care providers, it is imperative that we understand firsthand how the COVID-19 pandemic has affected and continues to affect pregnant women's perceptions of the prenatal care and education provided, and barriers encountered. On March 30, 2020 in a joint letter, ACOG, ACNM, AAFP, and SMFM acknowledged the stress and uncertainty the COVID-19 pandemic has placed on pregnant women and their support people and encouraged people to stay with the health care professionals whom have been providing their care. American College of Obstetricians and Gynecologists (2020) These organizations stressed importance of effective patient-provider communication during this time. Respondents from our survey primarily received information on COVID-19 and its effect on pregnancy and breastfeeding from their health care provider. This reinforces the importance of clear and timely communication between providers and patients about updates in hospital and office policies and procedures and how to remain safe and healthy during the pandemic. Health care systems should consider using their integrated personal electronic health record or other digital solutions to share messaging on COVID-19 policy and procedure updates to their pregnant population. In addition to health care providers, respondents also listed the CDC as a common source of information on COVID-19. Nurses in prenatal care settings should ensure families have access to reliable information on the most up-to-date science on the relationship between COVID-19 and pregnancy, so they can actively participate in shared decision making related to their pregnancy care.

We cannot underestimate the importance of support that pregnant people need during pregnancy especially during a pandemic. Although few participants answered questions related to safety and adequacy of their care, the themes around quality of care and the need for support are

areas for general improvement in maternity care. Quality in maternity care was a struggle before COVID-19 (Kozhmannil et al., 2017). The majority of those who felt their care was unsafe or inadequate had concerns about their prenatal appointments being cancelled or moved to virtual platforms. Given that most women in our study are in their first pregnancy, this might suggest that the reduction in the number of prenatal visits or shared decision making with their health care provider had a noticeable effect, but they still judged their care on the whole to be "safe."

This could be an opportunity to shift expectations and create a space where prenatal care can be virtual for some appointments (Peahl et al., 2020); however, communication with pregnant women and their support people must improve. Addressing concerns and expectations about the number of prenatal visits while providing remote support and monitoring either by phone or through a virtual visit is a role for nurses. A recent randomized control trial demonstrated increased patient satisfaction and decreased worry and stress with a remote support from nurses (Butler Tobah et al., 2019). The discrepancy between participants reporting safe pregnant care and adequate prenatal care is worthy of further exploration.

"Panic hoarding" is a common behavior among consumers preparing for stay-at-home orders across the nation. This behavior resulted in shortages of staple household and food items. Essential baby products, such as diapers, wipes, and formula, became scarce in stores, donation centers, and diaper banks (Grose, 2020; Kormos, 2020). In our study, of those who reported beginning to purchase items for their baby, over 40% reported difficulty in obtaining diapers and wipes and over 20% had difficulty getting a crib or bassinet and a car seat. It is essential that nurses caring for pregnant women in both in- and outpatient settings assess to determine if they have the resources needed to safely care for their newborn. Although this is something that should standardly occur, during a pandemic this is paramount. Our sample was highly educated, leading us to believe they had access to financial resources, yet they still reported challenges with getting supplies needed to care for their newborn. Health systems should consider providing families with supplies at discharge, especially diapers and wipes. A supply of these items can be provided inexpensively and help prevent families from having to go to the store soon after birth, risking exposure.

A recent study by Cronin et al. (2020) found that although concerned about becoming infected with COVID-19, the majority of labor and delivery nurses did not agree with excluding all support people during labor and birth. Only 17% of our survey respondents did not agree with the stricter visitation policies enacted by their health system. A common reason for disagreement with health system policies was doula not being allowed in addition to their support person. The Association of Women's Health, Obstetric, and Neonatal Nurses (2020) "opposes hospital policies that restrict the presence of a doula in the inpatient setting during an infectious disease outbreak." A doula's essential role on the birth team, and significant correlation with improved birth outcomes

warrants hospitals to reconsider allowing them to attend the birth (Bohren et al., 2017). Given importance of birth as a milestone life event, and the centrality of family participation for many pregnant women, the low number of participants objecting to this significant restriction implies they accepted the gravity of the pandemic even when it limited their family birthing options.

During the pandemic, innovative solutions to connect laboring women with their support people have emerged such as using virtual platforms to allow families and friends to visit and provide support. Due to visitation restrictions, increased opportunities for virtual doula support have emerged. Health care providers should ensure that everyone is aware of these options during pregnancy. Health systems should consider ways by which to provide virtual platforms free of charge so that patients who may not have unlimited cellular data plans can access their support. An example may include at admission, providing laboring families with tablets with video conferencing software so that families can connect. Due to visitation restrictions in the outpatient setting, virtual platforms should be offered at prenatal care and screening visits so that families and support persons can be involved and feel included in special visits such as ultrasounds.

Most of our sample reported that their face-to-face childbirth education classes were cancelled due to the pandemic and many reported that they were instead provided with an online option. Even among app users, 93.2% stated that if given an option, they would have preferred face-to-face prepared childbirth classes. Our findings further support evidence that during pregnancy there continues to be a desire for individuals to have opportunities to connect in-person and to build community. When unable to connect face-to-face due to concerns over the health and safety of pregnant women, instead of strictly online classes, health systems may consider the use of online synchronous childbirth courses, or at minimum build online communities for cohorts of women attending online childbirth classes, to build peer support and allow communication with childbirth educators in real time.

Although there were initial concerns reported about the possibility of vertical transmission of COVID-19 (Zeng et al., 2020), this does not seem to have affected decisions on initiating breastfeeding during the pandemic. The low number of participants who reported changing their infant feeding plans is consistent with previous research. Most women make a feeding plan before exposure to health care professionals, and the factors that are most crucial in their decision making include the partner's attitudes toward breastfeeding, family, and cultural factors (Brown & Davies, 2014; Earle, 2002; Kong & Lee, 2004). A perceived short-term formula shortage would not likely change the mind of anyone who had strong objections to breastfeeding. Similarly, most who choose to formula feed are aware of health benefits of breastfeeding for their infant (Fischer & Olson, 2014), so the pandemic might not alter their thinking especially because the CDC has reported children are a low-risk group (Centers for Disease Control and Prevention, 2020a).



If given an option, 93.2% of women reported they would have preferred face-to-face prepared childbirth classes.

Future nursing research is needed to understand the lived experience of a more racially diverse pregnant population during COVID-19. Due to significant changes in prenatal care visit schedules, further research is needed to determine how these changes have affected birth outcomes, including preterm birth, which is showing a decreasing trend during the pandemic in some isolated regions (Philip et al., 2020). More research is needed to determine how virtual visits with families, support people, and doulas have influenced birth outcomes and to assess pregnant persons' perception of virtual support and advocacy.

Limitations

Due to the racial and socioeconomic homogeneity of our sample, findings from our study may not be generalizable to all pregnant women. However, the majority of the sample reported being married and college educated and still reported barriers to obtaining necessary items, thus implying that others who have fewer financial and social resources may be experiencing even greater hardships and barriers to care. The sample was nationally representative, with participants residing in 44 different states in the United States; however, we had a small number of respondents from each state. Throughout the United States, states were

CLINICAL IMPLICATIONS

- Clear and timely communication between providers and patients about changes to hospital and office policies and procedures is imperative.
- Shared decision making is central to quality maternity care. Nurses must continue to ensure pregnant women and their families are included in decision making about prenatal care.
- Prenatally and prior to discharge, health care providers should carefully assess family's ability to access the items they need to care for their newborn as this may have been affected during the pandemic. Consider how to partner with health systems and community groups to provide resources to meet the needs of families affected by COVID-19.
- Ensure access to virtual platforms, at no charge, so that families can access support systems during both prenatal care and testing appointments as well as when admitted to the hospital.
- Future research is needed to better understand the relationship between pregnancy outcomes and altered prenatal care and testing schedules.

dealing with the virus at various stages in the curve, which influenced provider and health system preparedness. There were limitations in surveying people anonymously and we do not know if participants had problems with the survey or understanding the questions or answer choices. To address this, we provided opportunities for participants to write in their own thoughts or comments in text boxes.

Conclusion

There are significant research lags specific to how COVID-19 affects pregnancy which in turn influences health care providers' ability to use evidence to guide decision making (Martin, 2020). Understanding rates of COVID-19 continue to rise in many areas of the country, health systems must consider implications of an altered health care experience during pregnancy and birth. Although many participants reported a preference for in-person education and care, even more pregnant women reported receiving quality, adequate virtual care. With in-person care continuing to pose risks to depleted PPE resources and increasing COVID spread, health systems must adjust their care delivery to incorporate innovative solutions to meet the needs of pregnant women. ❖

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