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The impact of COVID-19 on prenatal care in the United States: Qualitative analysis from a survey of 2519 pregnant women

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A R T I C L E   I N F O

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A B S T R A C T

Objective: To explore if and how women perceived their prenatal care to have changed as a result of COVID-19 and the impact of those changes on pregnant women.

Design: Qualitative analysis of open-ended prompts included as part of an anonymous, online, cross-sectional survey of pregnant women in the United States.

Setting: Online survey with participants from 47 states within the U.S.

Participants: Self-identified pregnant women recruited through Facebook, Twitter, and other online sources.

Measurements and findings: An anonymous, online survey of pregnant women (distributed April 3 - 24, 2020) included an open-ended prompt asking women to tell us how COVID-19 had affected their prenatal care. Open-ended narrative responses were downloaded into Excel and coded using the Attride-Sterling Framework. 2519 pregnant women from 47 states responded to the survey, 88.4% of whom had at least one previous birth. Mean age was 32.7 years, mean weeks pregnant was 24.3 weeks, and mean number of prenatal visits at the point of the survey was 6.5. Predominant themes of the open narratives included COVID-19’s role in creating structural changes within the healthcare system (reported spontaneously by 2075 respondents), behavioral changes among both pregnant women and their providers (reported by 429 respondents), and emotional consequences for women who were pregnant (reported by 503 respondents) during the pandemic. Changes resulting from COVID-19 varied widely by provider, and women’s perceptions of the impact on quality of care ranged from perceiving care as extremely compromised to perceiving it to be improved as a result of the pandemic.

Key conclusions and implications for practice: Women who are pregnant during the COVID-19 pandemic have faced enormous upheaval as hospitals and healthcare providers have struggled to meet the simultaneous and often competing demands of infection prevention, pandemic preparedness, high patient volumes of extremely sick patients, and the needs of ‘non-urgent’ pregnant patients. In some settings, women described very few changes, whereas others reported radical changes implemented seemingly overnight. While infection rates may drive variable responses, these inconsistencies raise important questions regarding the need for local, state, national, or even global recommendations for the care of pregnant women during a global pandemic such as COVID-19.

Introduction

As the COVID-19 pandemic emerged and spread, hospitals experienced an influx of COVID-19 patients as well as critical shortages of everything from hospital beds to personal protective equipment (PPE). (Marquez and Moghe, 2020) At the same time, healthcare facilities had to accommodate existing patients who still needed care, including pregnant women (Orso, 2020).

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In the early months of the pandemic, the U.S. Centers for Disease Control (CDC) recommended prioritizing urgent visits and postponing elective care, while at the same time advising pregnant women not to skip prenatal appointments (CDC, 2020). Little was known about COVID-19’s effect on pregnant women and infants, and there were no standard recommendations specific to pregnant women regarding the evaluation or management of COVID-19. (ACOG, 2020) While CDC issued a statement suggesting that pregnancy did not appear to increase the risk of getting infected with COVID-19, they acknowledged that pregnancy has been linked to a “higher risk of severe illness when infected with viruses that are similar to COVID-19, as well as other viral respiratory infections, such as influenza.” (CDC, 2020).

In this context, many providers restructured care for pregnant patients to accommodate social distancing and minimize exposure for both patients and providers (Peahl et al., 2020A). In some cases, in-person visits were limited (Goligoski, 2020; Hauser, 2020). Yet in other cases, changes to prenatal care were minimal. This qualitative study sought to explore if and how pregnant women perceived their prenatal care to have changed as a result of COVID-19 and the emotional impact of those changes.

Materials and Methods

Study design: As part of a larger anonymous, online survey of pregnant women conducted between April 3, 2020 and April 24, 2020, (Moyer et al., 2020) women were given an open-ended prompt asking about how COVID-19 has affected their prenatal care. This study reports on the thematic analysis of the more than 2500 responses to these questions.

Setting: The English-language online survey was open to any pregnant woman, regardless of geographic location, and women were encouraged to forward the link to other pregnant women they knew.

Participants: Participants were self-identified pregnant women able to complete an online survey in English, regardless of gestational age of the pregnancy, location of residence, utilization of services, or other selection criteria. Participants were recruited via Facebook and Twitter social media platforms, including pregnancy-specific Facebook groups and snowball sampling from one pregnant respondent to others in her social network. The survey link was also distributed to pregnancy-specific professional communities for distribution. Recruitment materials said, “Pregnant during the COVID-19 pandemic? Share your experience. (survey link) We are researchers from the University of Michigan conducting an anonymous survey of women who are pregnant during COVID-19. It should not take more than 10–20 minutes to complete. Thank you in advance for telling us your story!”

To increase the diversity of our sample and reduce the bias toward well-educated, computer literate respondents, we sought respondents and gatekeepers in rural, urban, minority, and low-income populations, asking them to circulate the survey link within their networks. We also ensured that the survey could be easily completed on a smart phone as well as a computer.

Data sources / measurement

Data were collected via an online survey (full results reported elsewhere (Moyer et al., 2020)), formatted for use in Qualtrics. The survey assessed demographic and pregnancy-related factors, and the opened responses in this survey were drawn from a question asking, “Can you tell us a bit about how your experience with prenatal care has changed as a result of COVID-19? Do you feel like you are getting the same quality of care? Why or why not?”

The survey included basic demographic questions (such as maternal age, state/country of residence, rural/urban residence, education, and race) and pregnancy-related background questions (such as previous births, gestational age of the pregnancy, and utilization of prenatal care).

| Variable | Mean (+- SD) |
|----------|-------------|
| Maternal age | 32.7 (4.5) |
| Weeks pregnant | 24.3 (9.6) |
| Previous prenatal care visits | 6.5 (4.4) |
| Number of previous pregnancies | 0 (N %) |
| 1-2 | 396 (18.1%) |
| 3+ | 1323 (60.4%) |
| Number of previous births | 471 (21.5%) |
| Highest level of education | 160 (6.4%) |
| High school or less | 1083 (43.0%) |
| College or less | 663 (26.3%) |
| Master’s degree | 611 (24.3%) |
| Post-graduate degree | 658 (26.2%) |
| Residence Urban | 1433 (57.0%) |
| Peri-urban | 424 (16.8%) |
| Race White | 2202 (88.0%) |
| Black | 64 (2.6%) |
| Asian | 107 (4.3%) |
| Multiracial | 80 (3.2%) |
| Other | 48 (1.9%) |
| Ethnicity Spanish/Hispanic/Latino | 159 (6.3%) |
| Not Spanish/Hispanic/Latino | 2356 (93.5%) |
| Missing | 4 (0.2%) |

Data Analysis

All responses were read by two members of the research team (SJ, SB), with a third reading substantial portions (CAM). The research team devised a codebook and coded each entry with as many codes as appropriate, discussing any discrepancies and working to come to consensus in the face of inconsistencies. All were successfully resolved. Codes were then discussed and categorized per the Attride-Stirling Framework (Attride-Stirling, 2001).

Ethical Review and Reporting Criteria: All study materials and methods were reviewed and deemed exempt from ongoing review by the University of Michigan Institutional Review Board (HUM00179610). CORE-Q criteria were used in the planning, implementing, and reporting of this research (Tong et al., 2007).

Results

A total of 2,809 women responded to our survey with open-ended responses regarding the impact of COVID-19 on their prenatal care, 2519 of which were from the United States. The 290 respondents from outside the U.S. came from 27 different countries, thus this manuscript reports findings for women in the U.S. Table 1 illustrates the demographic characteristics of the sample. The mean age of respondents was 32.7 years, and the mean weeks pregnant at the time of the survey was 24.3 weeks. Most had at least one previous birth (88.4%), and the mean number of prenatal visits at the time of the survey was 6.5. Approximately half had a master’s degree or higher (50.6%), most lived in a peri-urban area (57.0%), and most were white (88.0%).

Figure 1 illustrates the conceptual framework that emerged from the data. Predominant themes included COVID-19’s role in creating structural changes within the healthcare system (reported spontaneously by 2075 respondents), behavioral changes among pregnant women and their providers (reported by 429 respondents), and emotional consequences for women who were pregnant (reported by 503 respondents) during the pandemic.
Structural changes to the health system as a result of COVID-19

The Covid-19 pandemic prompted the U.S. healthcare system to alter care provision for pregnant women in a variety of ways. These structural changes predominated women's responses, with respondents reporting changes to the frequency and type of prenatal visits, provider’s methods of operation, and a range of social distancing practices. These changes had varying effects on women’s perceptions of quality of care.

Visit changes

One of the most commonly reported structural impacts of COVID-19 reported by pregnant women in our sample was that providers reduced the frequency of in-person visits in favor of virtual visits and phone calls.

“...It was suggested that the remainder of my prenatal appointments be by phone, unless I need to be in-person for a test.” (30 years old, 3 previous pregnancies, 1 previous birth)

Yet for some women, providers were unable to accommodate a shift to video visits and instead relied upon the telephone.

“I have had appointments cancelled with virtual being the only option, but it (is) not yet available. Phone appointments are the only option at this time.” (33 years old, first pregnancy)

In addition, while providers canceled in-person visits, women themselves also canceled or delayed appointments they felt were unnecessary to avoid the risk of potential exposure to COVID-19.

“Instead of going to my most recent monthly check-up, I asked my NP if I could wait a couple of weeks. She said it was no problem to push the visit off a couple more weeks.” (34 years old, 6 previous pregnancies, 5 previous births)

Provider’s methods of operations

Providers altered their operations to increase safety for themselves, their staff, and their patients. This includes providers limiting in-person visits to only those patients in greatest need or those facing emergencies, or moving to different facilities to limit exposure to hospital settings.

“My practice has 3 locations. The doctors are all restricted to a single location... Patients are also restricted to a single location....my primary provider and myself are at different locations so I am stuck with different care providers.” (32 years old, 2 previous pregnancies, 2 previous births)

Social Distancing and Masks

As women reported, COVID-19 prompted providers to restructure their offices to enforce as much social distancing as possible, however the extent of distancing practices varied by provider.

As one woman reported:

“I have to wait in the car and I’m the only person allowed (no partners). In and out in 10 minutes. Doctor and MAs wearing PPEs and giving me hand sanitizer at every entry and exit point. I’m also escorted throughout the building (even during bathroom break). Overall felt more rushed and impersonal...because they have to stay away and can’t touch me unless absolutely medically necessary.” (28 years old, first pregnancy)

On the other hand, other women reported complete examinations that did not feel any different than during pre-COVID visits:

“My provider was hands on and did a thorough assessment.” (28 years old, 1 previous pregnancy, 1 previous birth)

Providers also vary in terms of their compliance with the recommendation of wearing masks in the clinic.

“...One staff person told me they weren’t allowed to wear masks because they don’t want to scare patients. I am scared they are not wearing masks!” (40 years old, 1 previous pregnancy, 1 previous birth)

Impact on Perceived Quality of Care

The changes to prenatal care had varying impacts on women’s perceptions of quality of care, with some feeling as though their care has been compromised, while others felt as though quality may have even been improved.

“I am definitely not receiving the same quality of care and feel like it’s a risk to my health and well-being to have limited appointments in the third trimester, and with a possible GD [gestational diabetes] diagnosis.” (30 years old, 3 previous pregnancies, 1 previous birth)

“My provider has changed 3 times. I cannot get clear answer(s) about what to expect at delivery. My breastfeeding and birthing courses were cancelled with no alternative offered. My hospital tour was cancelled and no information was provided.” (33 years old, first pregnancy)
Some women reported a shift in the focus of their appointments from pregnancy to discussing the impacts of COVID and related topics, limiting the time spent on ‘routine’ pregnancy questions.

“...The education given by the OB has dramatically shifted from normal pregnancy concerns to 95% about coronavirus. I feel like my questions about non-COVID issues are getting overlooked.” (32 years old, 3 previous pregnancies, 2 previous births)

Nonetheless, other women felt as though quality of care had not been compromised by the pandemic.

“I still believe that I got the same care as before the outbreak.” (28 years old, 1 previous pregnancy, 1 previous birth)

“My prenatal care was amazing prior to COVID-19, but I believe it has only improved since the virus concerns have grown. My doctor has been informative, supportive and answered all my questions about the virus and how it could impact my pregnancy and delivery.” (39 years old, 3 previous pregnancies, 2 previous births)

While data did not allow for a direct comparison of women obtaining care with midwives versus other types of providers, several respondents reported feeling relieved to be getting their care from a midwifery practice that was outside the hospital setting.

“I feel like a big part of the fact we are confident we are getting the same level of care is because we opted to go with a home birth midwife. Every time we see her, she spends over an hour with us and thoroughly answers all of our questions. Our virtual visit was no different. It’s also super helpful to know that because our midwife works out of a private office (not a hospital), her risk of exposure to COVID-19 is far lower than a hospital-based care provider, so we feel much more at ease seeing her in person than we would going into the hospital or a traditional Dr. office.” (28 years old, first pregnancy)

Behavioral changes as a result of COVID-19

The women in our study described several ways in which the structural changes prompted by Covid-19 have altered behavioral practices for both patients and providers surrounding prenatal care.

For women, prenatal behavioral changes included self-monitoring at home, specifically using blood pressure monitors and dopplers to monitor their own health.

“I bought my own blood pressure cuff and Doppler to use to monitor my baby myself.” (37 years old, previous pregnancies and births unknown)

Providers have also had to alter their behavior to accommodate healthcare structural changes. In addition to donning PPE and increasing social distancing in the clinical space, providers are being challenged to determine what is truly medically necessary in the face of a global pandemic, an issue that raises concerns for patients:

“(My) provider is reevaluating if non-stress tests are actually needed (for me) - originally I was told 3x per week after 32 weeks, now they are saying either 1x per week or not at all...” (36 years old, 3 previous pregnancies, 1 previous birth)

In some cases, providers’ concerns about preventing infection translated to a denial of care for pregnant women who work in healthcare, an issue described by several women:

“(I) was denied my 20-week anatomy ultrasound because I work as a nurse on the front line taking care of (COVID) positive patients. I feel like I’m treated like I have the plague.” (31 years old, 2 previous pregnancies, 1 previous birth)

Another healthcare worker reported calling her OB’s office in March 2020 to ask about the safety of continuing to work in a healthcare setting while pregnant, and being told that there was not enough information to say either way.

“Fast forward 2 weeks later, my OB called me... to cancel my appointment... because I work (in) healthcare and are ‘too much of a risk’ and they don’t want me to come into their office. THE SAME PLACE THAT (TELLS) ME IT IS FINE FOR ME TO KEEP WORKING IN A HOSPITAL BUT THAT I CAN’T COME TO THEIR OFFICE (emphasis original)... Mind you my OB and my hospital are all within the same health network.” (30 years old, first pregnancy)

Nonetheless, some women reported complete confidence in their providers despite changes related to the pandemic.

“[I] feel confident that my medical team will do everything in their power [to] keep my baby and I safe during labor and delivery.” (39 years old, 3 previous pregnancies, 2 previous births)

Emotional challenges as a result of COVID-19

Women reported that the changes in prenatal care due to COVID-19 resulted in a variety of emotional consequences, the most profound being increased fear and anxiety surrounding their prenatal and delivery care:

“I mostly feel a huge sense of fear, loss, and anxiety related to this pregnancy during a time when I wanted to feel excitement, joy, expectation....” (37 years old, first pregnancy)

In addition to anxiety related to the pandemic itself, women reported concerns that the disruptions to prenatal care might lead to potential pregnancy complications being missed.

“I’m a first-time mom and don’t have another full-term pregnancy to compare it to but, I worry an issue or problem could be missed due to appointments being spaced out, etc.” (32 years old, 1 previous pregnancy, 0 previous births)

Some women expressed emotional conflict as they weighed their fear of being exposed to the virus by visiting a healthcare facility against fears of missing a pregnancy complication by not attending in-person appointments.

“I am very healthy and question whether the risk of going to my appointments in person (and potentially getting the virus) outweighs my risks (if I didn’t have the appointment.” (30 years old, first pregnancy)

Women also acknowledge feelings of lack of support both by their own support people due to limitations on who is allowed to accompany women to visits, and by their providers for a lack of guidance and information.

Lack of support from partners and family during the prenatal process was particularly troubling for some women:

“It bothers me that my partner can’t come to my appointments with me anymore and (it) makes the appointments less relaxing and more stressful.” (40 years old, 2 previous pregnancies, 1 previous birth)

“My partner is no longer allowed to come to appointments with me, which is sad for both of us (especially the ultrasounds).” (38 years old, 1 previous pregnancy)

“The main thing I have an issue with is my partner cannot come with me (to prenatal appointments) so he loses that closeness to our child that he gains through going to appointments and ultrasounds with me.” (25 years old, 1 previous pregnancy, 1 previous birth)

“I have to go in for my next appointment because I need to do my glucose test, and my husband isn’t able to attend with me. I know I can do it on my own but having your support person is a huge deal.” (30 years old, unknown number of previous pregnancies)
Lack of perceived support by providers compounded the challenges some women felt:

“Care has become disjointed and care providers seem rushed and distracted. It feels a bit like I’ve been thrown into the deep end and told to figure it out.” (37 years old, 7 previous pregnancies, 2 previous births)

As non-urgent procedures are halted, several women have expressed confusion and concern over the guidelines providers are using to determine which procedures require in-person visits:

“(It) makes me question if [non-stress tests] were actually necessary, or were the providers just wanting to bill my insurance for more money?” (36 years old, 3 previous pregnancies, 1 previous birth)

These feelings of providers being rushed and distracted have evolved into women feeling abandoned by providers.

“I am forced to continually fight to be seen and have to reiterate my situation and reasoning over and over to each new person that answers the phone. I understand that they want as few people as possible in their office, but I don’t want to be out and about any more than they want me there. I got pregnant before this pandemic arrived, and now I have no choice but to advocate for myself but it has been very difficult.” (33 years old, 1 previous pregnancy, 0 previous births)

Among the women in our sample, feelings appear to have largely shifted from excitement to dread due to the coronavirus situation. As one woman described, “Before COVID, if I was to walk into an OB office, I think the staff would look at me and think all happy thoughts about expecting a baby and how it is such a happy time... but today when I walked into the office, I can’t help but feel like they see me as a risk to their health. They no longer see happiness and joy, they see (me as) a potential risk (to them).” (31 years old, 1 previous pregnancy, 1 previous birth)

Discussion

This nationwide study of 2519 pregnant women in the United States found that the COVID-19 pandemic has had a profound impact on women’s experiences with prenatal care, including structural changes, behavioral changes, and emotional consequences. The vast majority of survey respondents described substantial structural changes to care, including changes to the frequency of visits, a shift to virtual visits, social distancing practices, and consolidation of facility spaces. From a behavioral standpoint, patients increased home monitoring with blood pressure cuffs and dopplers, and providers limited procedures and appointments, redefined necessary testing and care, increased/decreased communication with their patients, and some refused care to healthcare workers. These changes, combined with fears surrounding the pandemic itself, sparked emotional reactions such as fear and anxiety, feelings of abandonment by providers or perceiving care to be disjointed, questioning the necessity of specific procedures and tests, fear of missing health issues, and an overall shift from joy about being pregnant to fear. While women expressed negative emotions associated with care modifications, it is important to note that some women had positive experiences with their providers, describing them as being more attentive and reassuring during these difficult times. Additionally, many women reported that although they have seen structural changes to their care, the quality of their care remains unchanged. Notably, women in the care of midwives repeatedly described limited emotional consequences and disruption of care.

These findings occur in a context in which approximately 4 million women give birth each year in the United States, making prenatal care one of the most commonly used preventive care services nationally (Osterman and Martin, 2018). With current recommendations including 12-14 office-based prenatal visits for low-risk women, women who are pregnant during the COVID-19 pandemic have faced enormous disruptions as hospitals and healthcare providers have struggled to meet the simultaneous and often competing demands of infection prevention, pandemic preparedness, high patient volumes of extremely sick patients, and the needs of ‘non-urgent’ pregnant patients. While previous research has suggested women might ultimately prefer fewer prenatal visits (Peahl et al., 2020A; Peahl et al., 2020B), the COVID-19 pandemic has proven extremely stressful for pregnant women (Davenport et al., 2020; Saccone et al., 2020) and the shift away from face-to-face care has been linked to greater changes in pregnancy-related anxiety (Moyer et al., 2020). Research suggests that some of this anxiety may be linked to feeling unprepared for birth as a result of fewer prenatal visits (Preis et al., 2020A; Preis et al., 2020B), at the same time that data suggest in-person obstetric visits did not increase women’s COVID-19 infections. (Reale et al., 2020) Thus at precisely the time when pregnant women could use additional support, structural changes implemented as a result of COVID-19 have reduced their perceptions of support, including during sonograms, an often important part of pregnancy for both the pregnant woman and her partner.

One interesting finding in this large, diverse sample of pregnant women was the wide range of structural and behavioral changes implemented as a result of COVID-19. In some settings, women described very few changes, whereas others reported radical changes implemented seemingly overnight. It is possible that geographic variability in virus prevalence drove many of the decisions, yet it raises important questions regarding the need for local, state, national, or even global recommendations for the care of pregnant women during a global pandemic such as COVID-19. This variability also highlights the fact that, to date, there is limited evidence regarding the ideal number and timing of prenatal care visits (Peahl et al., 2020A), although there is evidence that a change in prenatal schedule is associated with feelings of unpreparedness for birth (Preis et al., 2020A). As Peahl and colleagues describe their rapid implementation of an abbreviated visit schedule for low-risk pregnant women at the University of Michigan in response to the COVID-19 pandemic, they offer a reminder that the current visit schedule has been unchanged since 1930, absent of any compelling evidence for the timing or frequency of visits (Peahl et al., 2020A). The authors suggest that COVID-19 may serve as an important catalyst to rethink the way care is delivered, saving in-person visits for critical services and using telemedicine to stay connected and offer support in between to better meet the needs of both patients and providers (Peahl et al., 2020A). In fact, some data have suggested that reducing frequent or unnecessary prenatal care during COVID-19 has led to slight reductions in adverse birth outcomes, although further research is warranted to confirm such findings (Caniglia et al., 2020).

Our findings corroborate emerging research from Italy, China, and elsewhere in the U.S. that COVID-19 is having an extremely negative impact on pregnant women’s mental health. In one study of pregnant women in Italy, more than half of respondents ranked the psychological impact of the pandemic as severe (Saccone et al., 2020). Another study conducted during the pandemic showed that 40.7% of pregnant women and new mothers scored 13 or higher on the Edinburgh Postnatal Depression Survey (EPDS), indicative of clinically significant depression (Davenport et al., 2020). In China, authors found that when compared to pregnant women assessed prior to COVID-19, pregnant women assessed after COVID-19 scored significantly higher on the EPDS and they were also significantly more likely to endorse items associated with self-harm (Wu et al., 2020). Other research in Spain indicated that pregnant women reported decreased quality of life during the Spanish lockdown, with 52% of women unable to attend delivery preparation classes due to cancellation (Bivis-Roig et al., 2020). Additional emerging research has used a newly-developed COVID-19 Peritraumatic Distress Index (CPDI: Qui et al., 2020), finding that more than 15 percent of...
non-pregnant respondents in Italy indicated more than mild COVID-19 peritraumatic distress (Landi et al., 2020).

At the same time, other researchers in Israel found that women delivering during the COVID-19 pandemic have lower levels of depression during the immediate post-partum period than women delivering prior to COVID-19 (Pariente et al., 2020).

Our findings also illustrate the complex relationship between structural changes designed to reduce transmission of COVID-19 and potential downstream effects on pregnant women. As Beukens and colleagues report (Beukens et al., 2020), public health measures such as physical distancing and quarantine may have unintended consequences for pregnant women, including the potential for increased interpersonal violence at home, loss of social support, choosing to forego pre- and post-natal appointments, and exacerbation of post-partum depression and other mental health conditions (Brooks et al., 2020). One study from India illustrated that the impact of the lockdown alone was sufficient to increase anxiety, stress, and depressive symptoms (Gopal et al., 2020).

This study has several important implications. First, throughout the United States, providers have responded to the COVID-19 pandemic differently, meaning that women have experienced disruptions to their care in very different ways. While some women have appreciated the high-quality care they felt continued regardless of structural changes to care, others have felt somewhat abandoned, or ‘left to figure it out on my own,’ as one of our respondents said. Given the wide range of women’s perceptions of quality of care, the clinical implications of this study are that providers need to do a better job of communicating with patients, managing expectations, and working to ensure that patients understand the new processes and procedures. Second, while the decentralized nature of the U.S. healthcare system makes it challenging to fathom the implementation of national guidelines for the care of pregnant women during COVID-19, such guidelines would go a long way toward improving care. It is nonsensical that care should vary by provider in the face of a global pandemic.

Finally, our data confirm that women who are pregnant during the COVID-19 pandemic need additional support. This could include additional phone call contacts, such as Peahl et al. did by using medical student volunteers (Peahl et al., 2020A), expanding the use of social workers and counselors, and conducting frequent mental health screening with direct links to mental health resources. It is also important that future research explore the long-term impact of COVID-19 on pregnant women and new mothers. While some research has indicated improved outcomes during COVID-19 (e.g. reduced levels of prematurity (Hedermann et al., 2020)), we know that increased anxiety during pregnancy is linked to higher risks of post-partum depression, as well as poor birth outcomes (Brunton et al., 2019), and it will be important to determine if these outcomes are seen as a result of anxiety from COVID-19. Indeed, a recent study indicated a rise in the number of stillbirths during COVID-19 (Khallil et al. 2020).

This study has several notable strengths. It was a nationwide survey of more than 2500 pregnant women in the early acceleration phase of COVID-19 in the United States, representing respondents from 47 states who span a wide range of ages, previous number of births, and pregnancy duration. The survey’s open-ended prompt allowed for responses reflective of women’s first instincts when asked to think about how the COVID-19 pandemic has affected their prenatal care, limiting potential biases by asking about specific aspects of prenatal care. We believe it is among the first study to attempt to qualitatively describe how women’s experiences of care have been affected by COVID-19.

Nonetheless, this study has its limitations, including the possible selection biases associated with an online survey distributed primarily through social media, yielding a sample that is relatively well-educated and disproportionately white. While we believe the size and regional diversity of our sample and the lack of comparable data on this topic is indicative of the value of these data as a window into how women are thinking about their experiences of prenatal care during COVID-19, we cannot overemphasize the need for future research that focuses on communities of color. The documented barriers to care and differential outcomes of COVID-19 among Black women and women of color in the US (Goldfarb et al., 2020; Gur et al., 2020; Onwuzurike et al., 2020) warrants thoughtful, thorough, intersectional investigation with an eye toward understanding and addressing the unique challenges faced by pregnant women of color in the U.S. In addition, the open-ended narrative response format precluded our ability to do further prompting, limiting our ability to probe for additional comments or clarify ambiguities such as can be done during in-depth interviewing or focus group discussions. While some might suggest that this format is sub-optimal for qualitative analysis, we had 2519 women who were sufficiently motivated to talk about their experiences with prenatal care in an open-ended format, suggesting that this format, while not ideal, gave voice to important information that might have been missed otherwise.

In conclusion, this study provides an important starting point for providers, policy makers, and researchers seeking to understand and improve pregnant women’s experiences of prenatal care in the United States during the COVID-19 pandemic in 2020. Our data indicate a variety of structural and behavioral changes surrounding prenatal care are leading to profound impacts on women’s mental health and emotional well-being, issues which will be important to address as the pandemic continues.

Ethical Approval

All study materials and methods were reviewed and deemed exempt from ongoing review by the University of Michigan Institutional Review Board (HUM00179610).

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Clinical Trial Registry

Not applicable.

Conflict of Interest

The authors report no conflict of interest.

CRediT authorship contribution statement

Sarah Javaid: Methodology, Software, Formal analysis, Writing - original draft, Writing - review & editing. Sarah Barringer: Methodology, Software, Formal analysis, Writing - original draft, Writing - review & editing. Sarah D Compton: Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing. Elizabeth Kaselitz: Conceptualization, Methodology, Writing - original draft, Writing - review & editing. Maria Muzik: Conceptualization, Methodology, Writing - review & editing. Cheryl A. Moyer: Conceptualization, Methodology, Software, Formal analysis, Writing - review & editing.

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