









# Impact of the COVID-19 Pandemic on Patient Fertility Care

Journal of Patient Experience  
Volume 9: 1-7  
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DOI: 10.1177/23743735221098255  
journals.sagepub.com/home/jpx  


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## Abstract

The effects of the COVID-19 pandemic on the healthcare system have been widespread, with many institutions in the United States pausing elective procedures to redirect resources to critical care. Fertility care and assisted reproductive procedures were classified as elective procedures and similarly paused. We conducted qualitative interviews with patients and/or their partners ( $n = 25$  female patients;  $n = 3$  male partners) receiving care at a fertility clinic in the Midwest to understand patient appraisal of COVID-19 risk on the resumption of care following a month-long closure of an infertility clinic, and patient agreement with the clinic closure. Interview transcripts were thematically analyzed from a grounded theory approach. Study participants reported an increased sense of urgency due to the delay in fertility procedures. This urgency often superseded concerns of potential COVID-19 infection, motivating patients to continue fertility treatment during a pandemic. In hindsight, some participants did not agree with the clinic's closure and treatment cessation, feeling that these steps negatively interrupted time-sensitive reproductive goals. Patient responses highlight the need for additional resources to support decision-making during times of crisis. Triage patients based on time-sensitivity of treatment instead of a total shutdown respects patient autonomy for continuing treatment amidst uncertain COVID-19-impact.

## Keywords

women's health, qualitative methods, patient perspectives/narratives, COVID-19, bioethics

## Introduction

The discovery of the severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) virus, and subsequent declaration of the COVID-19 pandemic on March 11, 2020, by the World Health Organization (WHO), disrupted clinical practices across the United States (1). The high infection and fatality rate of SARS-CoV-2 led to the creation of task forces within specialty professional organizations designed to regulate measures to reduce the risk of COVID-19 transmission to health care workers and patients. Part of this strategy included the postponement of elective medical procedures. The American Society for Reproductive Medicine published guidelines on March 17, 2020, recommending suspension of new treatment cycles and pause of ongoing cycles with conversion of embryo transfers to embryo cryopreservation (2). Accordingly, many infertility clinics temporarily paused their practice between March and April 2020 to reduce SARS-CoV-2 transmission and

conserve medical resources. Early in the pandemic, pregnancy was an uncertain comorbid condition; little was known about the effects of COVID-19 on maternal and fetal health (3). Physicians were asked to inform patients of the uncertain risks of COVID-19 to pregnancy, leaving patients to contend with the decision to resume care in the face of pandemic uncertainty. Patients currently pursuing

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fertility care must continue to weigh this decision in light of the recent surge of COVID-19 infections caused by highly transmissible variants. The Delta and Omicron variants have overwhelmed hospital systems in certain geographic regions, resulting in state mandates to shut down all non-essential medical procedures and the enactment of crisis standards of care to triage intensive care unit beds and ventilators. As of January 2022, the Omicron variant is expected to infect up to one-half of the U.S. population, resulting in staff shortages and straining already burdened hospital systems.

At this stage of the pandemic, it is unknown how the patient experience of those receiving fertility care was impacted by clinic shutdowns in March/April 2020 due to COVID-19 and how patients assessed the risks of resuming treatment upon reopening of the clinic. To address this gap in the literature and to inform the medical community of best practices in the event of future shutdowns of elective procedures, we conducted a pilot exploratory qualitative study among fertility patients at a large clinic in the Midwest based on principles of grounded theory. Here, we report participant views on fertility care as an elective medical procedure in the context of the COVID-19 pandemic and how they evaluated the risks and benefits of resuming care following clinic reopening.

## Methods

### Recruitment

To achieve an in-depth understanding of the experiences of this subset of patients we employed a criterion purposive

sampling approach to identify fertility care patients likely to have their fertility care interrupted by a clinic shutdown due to COVID-19 (4,5). Mayo Clinic's electronic health record was used to curate a patient list of adult females who had a fertility care procedure within 6 months of March 15, 2020, the start date of the shutdown of Mayo Clinic's infertility clinic (March 15–April 7, 2020). All patients who met the study criteria were invited to participate in the study via a message through their online patient portal. Interested participants were contacted by the study coordinator for scheduling to participate in a telephone or video interview following written consent and Health Insurance Portability and Accountability Act (HIPAA) authorization. HIPAA authorization is necessary under U.S. federal law where sensitive patient health information may be disclosed and used for research purposes (6). Participants were informed that their partner was also invited to participate and that the interview could be conducted individually or with their partner. This study was reviewed by the Institutional Review Board of Mayo Clinic and determined to be minimal risk.

### Data Collection

A semi-structured interview guide was prepared by members of the research team, with expertise in reproductive endocrinology, infertility, qualitative research methods, and bioethics. Interviews were conducted between August and December 2020 by 2 researchers (KD and MO), recorded with participant consent, and transcribed verbatim. Interviews lasted an average of 35 min and 53 s. Data was collected until the researchers felt that thematic saturation was met, the standard by which purposive sample sizes are determined in qualitative research interviews (7).

### Data Analysis

The research team conducted a qualitative analysis of research transcripts in accordance with principles of iterative grounded theory-based methods (8,9). Grounded theory analysis refers to an inductive approach in which theories are developed after data collection and analysis (10,–12). The advantages of this approach include in-depth and systematic analysis of novel phenomena (13). This approach was selected due to the unprecedented impact of COVID-19 on fertility practice, which made deductive approaches impractical (8). Three researchers (KD, MO, and GC) utilized open coding from inductively identified and iterative content from an initial analysis of  $n = 4$  transcripts (16%) coded to consensus, which was chosen as representative transcripts of different patient subgroups. Axial coding was used to create a coding schema (ie, codebook) based on inductively identified and discrete categories of the patient experience related to fertility care and COVID-19. Following additional refinement and finalization of the codebook, 3 researchers (KD, MO, and GC) evenly divided the transcripts and used

**Table 1.** Treatment Type and Infertility Diagnosis of Participants.

	Female		Male	
	<i>n</i> =		<i>n</i> =	
Number of participants	25		3	
Treatment	<i>N</i>	Average age (range)	<i>N</i>	Average age (range)
Oocyte cryopreservation	1	28	—	—
Ovulation induction	3	31 (28-32)	—	—
IUI	4	34 (31-37)	—	—
Preparing for IVF	4	33 (30-35)	1	30
Mid cycle—IVF	9	35 (30-42)	2	46 (39-53)
Frozen embryo transfer	5	32 (28-35)	—	—
Infertility diagnosis	<i>N</i>	Average age (range)	<i>N</i>	Average age (range)
Unexplained	6	33 (30-38)	1	30
PCOS	3	32 (31-34)	—	—
Endometriosis	4	31 (28-37)	—	—
Partner infertility	4	34 (30-37)	—	—
Tubal factor	2	35 (32-37)	—	—
Other	5	36 (31-42)	2	46 (39-53)
Unreceived/delayed	1	28	—	—

Abbreviations: IUI, intrauterine insemination; IVF, in-vitro fertilization (IVF); PCOS, polycystic ovarian syndrome.

the software program NVivo 12 to individually code the transcripts. Each transcript was reviewed by a second researcher for coding accuracy and consistency. Weekly meetings were held between the 3 researchers to resolve any coding discrepancies and maintain research rigor. Following coding completion, the codes were thematically analyzed in reference to the research aims. We report here on themes pertaining to the impact of the clinical hiatus on participants' diagnosis and treatment, decisions to resume care, and views on the clinic shut down. Results are reported in accordance with the Standards for Reporting Qualitative Research compiled by O'Brien et al (14).

## Results

### Demographics

A total of 25 interviews were completed. Twenty-two interviews were conducted individually and 3 in partner dyads. The 25 female participants averaged 33 years in age (range: 28-42) and the 3 male participants averaged 41 years in age (range: 30-53). Table 1 describes the participants' infertility diagnosis and the treatments they were receiving at the time of the clinic shut down.

### Impacts of Clinic Hiatus on Patient Experiences With Diagnostic and Treatment Delays

In accordance with professional guidance, The Division of Reproductive Endocrinology and Infertility (REI) at Mayo Clinic elected to halt assisted reproductive technology cycles on March 15, 2020. Participants who initiated care prior to the clinic shutdown were faced with diagnostic and/or treatment delays. A couple of participants reported experiencing a diagnostic delay, including the receipt of an infertility diagnosis and preimplantation genetic testing results:

I never got to have my follow-up to find out if I have any kind of [infertility] diagnosis (...) Did that [diagnostic procedure] right before everything closed down. That's supposed to make you more fertile for three to six months, so I wasn't lost all of that time after cause they weren't able to prescribe any medications.

—Female, 28 years old, Oral Medication

Participants who reported experiencing a treatment delay described an emotional impact caused by the pause of fertility treatments, detailing feelings of frustration and increased stress due to the elongation of their fertility journey. Some felt that they were denied opportunity for pregnancy due to their fertility patient status, comparing themselves with those who did not have such restrictions.

It was kinda like somebody—I guess the way it felt was, it felt like some higher-up medical person in some office

somewhere said, “We don't want you having children right now, so we're not going to give you children.” That's what it felt like. Meanwhile, everybody else is at home fornicating 'cause they've got nothing better to do. (...) They didn't mandate that every other woman of childbearing age get put on IUDs or birth control.

—Female, 37 years old, Intrauterine Insemination (IUI) with Donor Sperm

Those who did not experience diagnostic or treatment delay were more likely to report being on oral medications, between cycles, or not actively seeking treatment during the time of delay. Timing played a contributing factor to the magnitude of emotional impact patients experienced. Participants who were of advanced maternal age and/or had experienced prior unsuccessful treatment cycles described feelings of frustration and disappointment because of treatment cessation. At the time of the shutdown, a few participants reported they were nearing the end of their assisted fertility treatment due to multiple factors including advancing maternal age, time constraints, and/or financial limitations, and expressed an urgency to try and conceive before these circumstances limited their ability to conceive or continue with their fertility treatment.

Just because I knew we were on a time crunch and I didn't know how long it was gonna be delayed for, so it just seemed like we got our hopes up and we were getting ready to do this whole process and then it just—everything was just—it was a letdown. We weren't sure would be able to complete it before July [2020]? Then, if not then it was our last chance at having a child.

—Female, 38 years old, IVF

### COVID-19 Impact on Financial and Resource Limitations

During their interviews, most participants brought up the financial implications of COVID-19, highlighting the expense and high stakes of each conception attempt. For patients in the middle of in-vitro fertilization (IVF) or awaiting embryo transfer, the clinic shutdown resulted in substantive financial loss.

All the medications that I was taking at the time, pretty much, was for nothing. That was probably the hardest part was all that money and time was just thrown away. Yeah, that was probably the hardest part 'cause then, when it comes to doing IVF, obviously, it's expensive the way it is. To drop it midway in hopes to pick it back later—just thinking of all that money that's continued to just keep going kinda thing.

—Female, 30 years old, FET

For some, the delay in treatment interrupted their plans to maximize insurance benefits resulting in additional costs, such as continuing with an expensive insurance plan for an

additional year to minimize the cost of their fertility treatments.

It's super emotionally upsetting to us when we weren't able to proceed as we planned earlier in this year...I was only going to cover myself with my employer for one year, so I can have the benefit for the coverage, have a baby by the end of the year, everything meet our accumulations one time (...) Unfortunately, now with the delay, I do have to carry my insurance for another year and have to pay for the medications again.

—Female, 35 years old, FET

Other participants described non-monetary limitations, including limited remaining cryopreserved embryos or gametes and/or advancing maternal age that limited their opportunities for reproduction. Some participants felt the clinic didn't take these concerns seriously when evaluating the shutdown.

I've only got so many vials of sperm... I kinda feel like they [REI clinic] don't really feel like my limited resources and continuing advancing age is a concern.

—Female, 37 years old, IUI

### *Risk Perception and Fertility Decisions*

When the clinic reopened on April 17, 2020, patients were given the option to resume fertility treatments disrupted by the closure. Participants reported deliberating with their partner over whether to return to their fertility treatments and if so, when. COVID-19 impact on maternal and fetal health was a primary concern for participants. For some, these concerns were factors in their decision to delay the resumption of care when the clinic reopened.

One of the other reasons why we're not seeking active care at this point in our ages just because it scares me a little bit just from what I've seen on the news—there's potential for preterm labor, something like that. We don't want to put an unborn child at risk for complications just because of the pandemic.

—Female, 32 years old, Oral Medication

However, others stated that they felt COVID-19 would have minimal impact on their health and downplayed potential risks of an infection. Others believed the measures taken by the clinic would sufficiently protect them against exposure to the SARS-Cov2 virus.

I'm pretty immunocapable, so I'm not overly concerned about me. I work on a farm. I get cow manure in my ear on a daily basis, so a little coronavirus isn't probably really gonna affect me much.

—Female, 37 years old, Intrauterine Insemination (IUI) with Donor Sperm

Concerns over advancing maternal age and length of time spent trying to become pregnant were driving factors in resumption of treatment. On average, participants were trying for pregnancy for approximately 2 years at the time of the interview. Combined with the uncertainty surrounding the duration of COVID-19, the length of the fertility journey motivated many to resume treatment when services became available.

I was very torn on whether or not it was safe to pursue getting pregnant, but then again, there was no end in sight. I guess I just figured if they were gonna open it up and do it safely, it was safe enough for me to do it. I'd waited so long. We'd been trying for over four years, at that point, that I guess I like—I'm gonna bite the bullet and fight the risk.

—Female, 31 years old, IVF

Patients who decided to resume fertility treatments reported being aware of the risk of COVID-19 exposure within the clinic and accepted this risk as a cost of resuming treatment. For some, this risk was elevated due to comorbidities.

The concerns of every time you go in (...) because there's so many people there, you run the risk of getting it [COVID-19] and stuff like that. My big thing is, I'm—I have an autoimmune condition, and I take immunosuppressants, so I don't really fully know how contracting it would affect me, so I have that extra little bit of having to be cautious kind of thing.

—Male (partner), 39 years old, IVF with donor eggs

### *Agreement with Clinic Shutdown*

Most patients expressed that at the time of the initial shutdown, they agreed to some extent with the necessity of the clinic's closure. Participants acknowledged that the limited information on COVID-19 impact on pregnancy and the critical need to redirect medical resources to COVID-19 patients justified this decision. Nevertheless, participants were concerned about the impact that this decision would have on patients in the midst of fertility treatment.

I truly think that there are things that we needed to do as a community and a society to help with this pandemic. I understand that. I think it was hard for me for the women that were in the middle of a cycle. I was like, "Oh, my gosh! We can't even let them finish this cycle?" That's torture.

—Female, 34 years old, IVF

A small number of participants said they disagreed with the decision outright, stating that the clinic shutdown felt like they were being denied the opportunity to become parents.

It wasn't something I wanted to do, because we had come so far in our treatment, and because we were so close to that end

game date. In the moment, no. I don't think it's something anybody wants to be told. Like, Oh, sorry. We're just done. There's nothing we can do about it.

—Female, 28 years old, FET

For a subset of patients, feelings about the shutdown shifted as the pandemic progressed, expressing that while they were initially supportive of the shutdown, they came to feel like it had been unnecessary, especially for women with disrupted egg retrieval or IVF cycles. These views were informed by their observation that others were safely having children during the pandemic.

If I was in the midst of [frozen embryo transfer], I think it'd be that much harder to say it's not necessary [fertility care]. I would say that the women who were getting ready to get their eggs harvested should have finished their treatment, but hindsight's 20/20.

—Female, 31 years old, Frozen Embryo Transfer

## Discussion

While the decision to shut down the infertility clinic was made in response to professional guidance, the decision had a significant negative impact on patients, including financial and emotional harm. Participants reported feelings of frustration regarding the clinic's March/April 2020 closure and exacerbated stress due to strained financial and resource considerations. This, in conjunction with advancing maternal age and previous failed cycles, left many patients with concern as to how the shutdown may impact their reproductive goals. The psychological impact of infertility is well-reported in the literature and in many cases has been heightened by the global pandemic (15,–18). Studies conducted earlier in the pandemic have ranked infertility as a top stressor among non-pregnant women (19). Additionally, the stress of infertility was exacerbated for patients of advanced maternal age and those with previous IVF attempts during COVID-19 (19,20). Our findings are consistent with prior reports describing symptoms of stress and anxiety in this patient population, although they were not assessed using validated measures as in previous studies, but rather are based on participants' self-report. In this cohort, participants who were older had failed IVF cycles or were resource-limited—financially, or by a number of cryopreserved sperm samples or embryos—were more likely to express distress related to their infertility and potential delays.

Most participants were ready to resume treatment when the option became available, especially those in whom maternal age and/or financial constraints placed time limitations on their chances of pregnancy. Many participants expressed concern that continued exacerbation of the COVID-19 crisis may result in additional future clinic shutdowns, adding to pressure to resume treatment. Maternal and fetal safety were important considerations in the decision to resume treatment; however, some participants minimized the risks of

COVID-19 infection, expressing a belief that if they were to develop COVID-19 while pregnant, it would be unlikely to result in severe illness or maternal-fetal harm. These participants often cited anecdotal reports of asymptomatic or mild illness among family or friends to support this perception. This may reflect the limited knowledge of pregnancy as a comorbid condition at the beginning of the pandemic when this data was collected. Since then, data showing increased morbidity in pregnancy following COVID-19 infection have raised additional concerns regarding the need to exercise extra caution in pregnant women and those seeking to become pregnant (21,–25). A multinational study assessing maternal and neonatal morbidity and mortality found that regardless of COVID-19 symptoms, pregnant women were at significantly higher risk of complications and poor pregnancy outcomes, including preeclampsia, eclampsia, preterm birth, intensive care unit admission, and maternal death. Neonatal outcomes were observed to reflect the severity of maternal illness, although lower than maternal risks (26,27).

Participants, especially those of advanced age or resource limitations, frequently rejected the idea of fertility treatment as an elective procedure that could be indefinitely postponed. These findings are similar to previous observations that participants evaluated clinic closures as an obstacle to parenthood (28). It is unlikely a month delay was detrimental to patient attempts at conception; however, for some patients already dealing with the emotional stakes of fertility treatment, this delay felt like a denied opportunity for parenthood. Comparisons regarding the impact of COVID-19 on fertility care can be drawn to other patient groups including those pursuing reconstructive or bariatric surgery, fields where procedures are considered to enhance patient quality of life but are similarly classified as elective. Similar to outcomes found in fertility patients, patients pursuing bariatric surgery amidst the pandemic reported a significant impact on patient mental health and highlighted a need for personalized care strategies to improve overall well-being (29,–32). This more tailored approach, however, should be leveraged with the responsibility to proactively manage an evolving medical crisis, including the need to address system-level strains caused by staff shortages and the need to redirect resources to acute patients. Timely and clear patient communication may mitigate distress at the postponement of fertility care and a perception that their care priorities are being singularly deprioritized.

As of January 2022, COVID-19 case numbers continue to rise both in the U.S. and globally, due to the increased transmissibility of viral variants. Geographic variability in vaccine uptake has contributed to continued surges in COVID-19 cases and deaths (33). It is likely that local and regional hospital systems will continue to redirect clinical resources toward pandemic management, potentially including the postponement of elective medical procedures. Participant experiences of the March/April 2020 infertility clinic shutdown may inform how to improve patient communication and transparency around decisions to postpone treatment as well as determine how to prioritize patients upon reopening.

Our findings suggest that the postponement of elective procedures should be evaluated with more refined criteria, rather than a blanket prohibition, given that this decision may result in material harm to patients, particularly among procedures that require significant upfront financial investment, or for which their success is time-dependent.

### Strengths and Limitations

To our knowledge, this is one of the first in-depth qualitative explorations of the experience of patients who were pursuing fertility treatment at the time of the COVID-19-related clinic shutdowns of 2020. This was a small pilot exploratory study of 28 participants; future studies are planned with a large sample to triangulate initial findings. As this was a relatively cohesive cohort, we reached thematic saturation (ie, no new themes were discussed in the interviews) mid-way through the participant interviews and continued to reach a sample size acceptable for a purposive sample with a discrete study aim (34). All participants were encouraged to invite their respective partners to participate in the study. Work and time limitations, and/or less willingness to discuss sensitive topics may have limited partner participation. Self-selection bias is a potential limitation; participants may have been more willing to participate if they experienced greater impact of COVID-19 on their fertility experiences. Data collection occurred chronologically adjacent to the primary shutdown so recall bias is likely to be limited. All participants identified as non-Hispanic White except for 1 female participant who identified as Asian, however, this is expected given the clinic demographics and lack of diversity among REI patients more generally (35,36). Future studies should examine potential decisional regret of the pursuit of fertility care during the height of the COVID-19 pandemic compared to waiting until localized spread was reduced. Long-term effects of loss of social support, stress injury, and financial instability should also be explored.

### Conclusion

In the face of the COVID-19 pandemic, the stress of infertility remains pervasive among fertility patients and was the primary driver behind decisions to resume treatment amidst pandemic uncertainties. The level of psychosocial impact due to treatment delays experienced by patients varied based on age, treatment, length of time trying to conceive, and resource limitations. Patient and partner perceptions of the urgency of fertility care highlight the need for additional resources to support decision-making in times of public health events. This includes communication of the systems-level constraints posed by the event, reasons for the temporary shutdown of elective procedures, and any known risks to patients. Triage patients based on time-sensitivity of treatment instead of a hard shutdown might respect patient autonomy in continuing treatment despite uncertain public health impacts as well as addressing

patient concerns over the characterization of their fertility care as elective.

### Acknowledgments

The authors would like to thank all study participants for sharing their experiences. Ms. Riggan (KR), Dr Ainsworth (AA), Dr Shenoy (CS), and Dr Allyse (MA) are funded by the Mayo Clinic Department of Obstetrics and Gynecology. Dr Allyse is additionally funded by NHGRI grant K01 HG009642. Ms. DSouza (KD) and Ms. Orellana (MAO) are supported by CTSA Grant Number TL1 TR002380 from the National Center for Advancing Translational Science (NCATS). The publication's contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIH. The authors KD, MAO, AA, Gabrielle Cummings (GC), KR, CS, and MA report no conflicts of interest.

### Ethical Approval

This study was reviewed and approved by Mayo Clinic's Institutional Review Board (ID # 20-000559).

### Statement of Human Rights

All procedures in this study were conducted in accordance with the Mayo Clinic's Institutional Review Board's (ID # 20-000559) approved protocols.

### Statement of Informed Consent

Written and verbal informed consent was obtained from the patient(s) for their anonymized information to be published in this article.








### Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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