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Stress, coping and silver linings: How depressed perinatal women experienced the COVID-19 pandemic

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ABSTRACT

Background: Research on perinatal mental health during the COVID-19 pandemic has largely focused on data from community samples. This study sought to understand the experiences of pregnant and postpartum women with histories of clinically elevated symptoms of depression.

Methods: Participants included 60 perinatal women who participated in wellness intervention trials for women with antenatal depression. We used a mixed methods approach, assessing depression, anxiety, stressors and coping behaviors, along with narrative responses to questions regarding COVID-specific effects on mental health.

Results: Over three-fourths of the sample indicated a worsening of mental health during the pandemic, with 31.7% of women endorsing clinically elevated depression symptoms and 36.7% screening positive for anxiety. Women reported negative impacts on their emotional wellbeing, especially a resurgence of mental health symptoms. Participants also articulated positive experiences during the pandemic, including an appreciation for increased time with family, especially infants. Women detailed numerous, mostly adaptive, coping strategies they had used to mitigate stress; self-isolation and spending time outdoors were associated with having depression above or below the clinical cut off, respectively.

Limitations: The study had a small sample, and the generalizability of findings may be limited, given that participants were clinical trial completers.

Conclusions: Although the pandemic upended many aspects of life for perinatal women and raised mental health concerns, many also reported adaptive means of coping and positive experiences or 'silver linings' related to pandemic restrictions. Some coping strategies that were utilized, including wellness-based behaviors, may have helped to mitigate the impact of COVID-19 related stress.

1. Introduction

Following major changes to healthcare policy and delivery practices due to the COVID-19 pandemic, myriad reports called for special attention to at-risk populations impacted by the pandemic, including perinatal women (Anmelia et al., 2020; Davenport et al., 2020; Hermann et al., 2020). In the United States, a national cohort study of pregnant women with COVID-19 concluded that the course of illness is "prolonged and nonspecific" (Afshar et al., 2020). Early case studies of COVID-19 infection among pregnant women, buttressed by a Lancet review (Chmielewska et al., 2021), suggest a general worsening of

maternal and fetal outcomes since the onset of the pandemic, including increases in maternal deaths, stillbirth, and maternal depression (Rodriguez et al., 2020; Rashidian et al., 2020). The ambiguity regarding the impact of COVID-19 on mothers and infants, combined with subsequent reporting of potential serious consequences of infection for both mothers and newborns may lead perinatal women to be particularly vulnerable to the effects of COVID-related stress and the onset or recurrence of psychiatric disorders.

Several studies have shown a significant increase in rates of depression symptoms from before and after the start of the COVID-19 pandemic in community samples of perinatal women (Wu et al., 2020;

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Berthelot et al., 2020; Lebel et al., 2020). Additionally, there are preliminary reports, including one meta-analysis, suggesting that perinatal women are at particular risk for increased anxiety due to the COVID-19 pandemic and related stressors (Hessami et al., 2020; Moyer et al., 2020; Saccone, 2020). A recent review of evidence to date concluded that the pandemic has been associated with increases in anxiety and depression among pregnant and postpartum women (Kotlar et al., 2021). Increased stress has been shown among at least 30% of community samples of pregnant women and has been associated with a number of idiopathic and environmental characteristics including history of abuse, high risk pregnancy, chronic illness, pandemic-related income loss, perceived risk of having had COVID-19, changes to prenatal appointments and being a woman of color (Preis et al., 2020a). Stressors that are unique to COVID-19 – such as worries about being unprepared for birth due to the pandemic – were found to predict increased anxiety among pregnant women during the pandemic (Preis et al., 2020b). Other COVID-19 related stressors (food scarcity, loss of income, loss of childcare, tension in the home) may put inordinate stress on parents (Barbosa-Leiker et al., 2021; Boekhorst et al., 2020; Moyer et al., 2020). These reports, as well as the known adverse effects of stress on perinatal outcomes (Woods et al., 2010; Ibrahim and Lobel, 2020), highlight the critical need to understand how the pandemic may be affecting the wellbeing of perinatal women and their offspring.

While reports have begun to describe the impact of the pandemic on pregnant and postpartum women generally, it is important to understand how the pandemic has affected perinatal women with histories of depression, a particularly vulnerable group. Women with a history of depression are at higher risk for development of perinatal psychopathology (Howard et al., 2014) and chronic stress can magnify this risk. One study (Liu et al., 2021) recently found that perinatal women with a history of mental health diagnoses were 1.6–3.7 times more likely to report elevated anxiety and depression symptoms during COVID-19 than those without preexisting mental health conditions. Another report examined perceived impact of the pandemic on mental health among perinatal women recruited for a randomized trial of integrated OB/GYN and behavioral healthcare, finding that women who screened positive for depression endorsed a greater perceived impact of the pandemic on their mental health, as well as greater disruption in accessing mental health care (Masters et al., 2021). These studies provide initial indication that perinatal women with histories of depression or anxiety may be at heightened risk for distress as a result of the pandemic. However, less clear are the specific nature of perinatal women's concerns, how they perceive the pandemic to impact their well-being, and coping behaviors that have been helpful during the pandemic.

Qualitative methodology can be helpful for this type of inquiry. Some prior studies have utilized qualitative and mixed methods to examine perinatal women's experiences during the pandemic, yet these studies have focused upon community samples (Barbosa-Leiker et al., 2021; Farewell et al., 2020; Moyer et al., 2020) and provide less information about women with histories of depression. Understanding how women with depression histories cope in the context of a significant public health emergency is critical, given the particular risks of depressed individuals engaging in social withdrawal and isolation (Kupferberg et al., 2016). In fact, pre-pandemic studies have linked specific coping strategies with stress mitigation to offset risk for psychopathology following natural disasters (Oni et al., 2012). For example, some research has found that perinatal women with depression are significantly more likely than non-depressed perinatal women to engage in non-adaptive coping such as isolation, denial, blame and substance use (DeTychev et al., 2005; Guardino and Dunkel Schetter, 2014), strategies that can contribute to adverse outcomes for mother and infant. In the current study, we examined clinical symptoms, COVID-19 concerns and stressors, and coping strategies utilized among a sample of perinatal women who experienced depression elevations prior to the pandemic. Further, we examine the extent to which women's chosen coping strategies were associated with clinically elevated symptoms at the time of

the assessment.

2. Method

2.1. Participants and procedures

Participants were pregnant and postpartum women who had taken part in one of two randomized controlled trials (RCTs) that were designed to evaluate non-pharmacologic wellness interventions for women with elevated antenatal depressive symptoms, The Healthy Expectations Study (NCT02470862) and The Wellness for Two Study (NCT02738216). In both studies, expectant mothers were recruited through brochures and screening in community prenatal care practices, internet/social media, and other community locations in Rhode Island and Southeastern Massachusetts. Participants provided informed consent as approved by the hospital's Institutional Review Board. Women were enrolled if they were age 18 or older, currently between 12 and 27 weeks gestation at the time of enrollment into the parent study, had a healthy, singleton pregnancy, experiencing moderate symptoms of depression on the interviewer-administered Quick Inventory of Depressive Symptomatology (QIDS; Rush et al., 2003), and medically cleared for moderate exercise. Exclusion criteria included new or unstable depression treatment, diagnosis of bipolar or psychotic disorders, self-reported hazardous drug or alcohol use, and acute suicidality. In addition, participants who were already routinely engaging in certain wellness activities (e.g. prenatal yoga practice, physical exercise) were not enrolled into a trial testing that approach. Participants in Wellness for Two were randomized to a 9-week prenatal yoga program or a 9-week perinatal health education intervention; participants in Healthy Expectations were randomized to either a 10-week prenatal walking program or a 10-week perinatal health education program. In both studies, women completed assessments of mood, functioning, and other outcomes during the active intervention phase, at the endpoint of the intervention, and at a postpartum follow-up. In all, 272 women were randomized into the two trials. Women who completed the active intervention phase of either RCT during the time of the COVID-19 pandemic were invited to participate if they were pregnant or less than 12 months postpartum at the time of data collection for the COVID-19 survey ($N=71$ women invited). The majority of women contacted ($N=69$) expressed interest in the survey, and 60 women ultimately completed the measures for the present study, all between the months of April 2020 and April 2021. The majority of these women ($N=53$; 88%) participated in the early months of the pandemic between April 2020 and June 2020. Participants completed a self-report measure that included clinical symptom measures, survey questions, and open-ended questions via a secure online research platform (REDCap) were compensated with a \$20 gift card.

2.2. Data sources/measurement

2.2.1. Assessment of clinical history and symptoms

Women were interviewed upon entry into the parent study using the Structured Clinical Interview for the DSM-V (SCID-5; First, 2015) to determine whether diagnostic criteria were met for current or past major depressive disorder (MDD). Structured questions were added to the SCID-V interview to assess for history of suicidal and self-injurious behavior.

The Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987) was used to measure depression severity at the time of the COVID-19 survey. The EPDS is a widely-used, 10-item self-report scale for perinatal populations with established validity and reliability. A score of 13 or greater was used to define clinically elevated depression (Cox et al., 1987).

Anxiety was measured using the 3-item EPDS anxiety subscale, often used to screen for anxiety in perinatal samples (Matthey, 2008; Tuohy and McVey, 2008), with a cutoff of 6 or more reflecting clinically

relevant anxiety (Matthey, 2008).

2.2.2. Survey questions regarding COVID-19 pandemic experiences and coping

A subset of items from the Coronavirus Perinatal Experiences Impact Survey (COPE IS; Thomason et al., 2020) was used to capture the impact of the COVID-19 pandemic, including disturbance in perinatal care and delivery plans, exposure and infection, employment/financial changes, restriction of activities, and coping activities. For example, in a yes or no format, women endorsed COVID-19 exposure and infection as it pertained to themselves and close family members. They were also asked whether they had experienced or knew of COVID-related hospitalizations and/or deaths. All women rated themselves and their household family members on social distancing efforts on a scale of 1(not at all following guidelines) to 7(following guidelines closely and consistently). To assess employment related concerns, participants were asked to endorse the following changes as they apply to themselves and their close family members: move to remote work, loss of hours, decreased pay, loss of job, decreased job security, disruptions due to child care challenges, increased hours, increased responsibilities, increased monitoring and reporting, and having to fire or furlough employees. Additionally, pregnant women were asked to rate 10 pregnancy related concerns on a scale of 1 (not at all a concern) to 7 (a very strong concern); postpartum women were given four postnatal concerns to rate with these same anchors (see Table 2). There were also items specific to this study that asked women to provide a yes or no response. One question assessed changes in women’s physical activity behaviors since the pandemic. Women were also asked whether they used specific coping strategies including wellness activities such as yoga, music, art, and spending time in nature (see Table 3). Women could endorse all coping strategies that they had used.

2.2.3. Open-ended questions regarding COVID-19 pandemic experiences and coping

Open-ended prompts were included for participants to describe in their own words COVID-19 related stressors, worries, mental health effects, coping, “silver linings” of the pandemic, and advice to share with other perinatal women. The following questions were asked: (1) In general, what has been the most stressful aspect of the COVID-19 experience for you, and why?; (2) In your own words, what are the main ways that the COVID-19 situation has affected your emotional experience or your mental health?; (3) In general, what is your greatest worry about how COVID-19 may impact your pregnancy, birth (for prenatal women only) and postpartum experience?; (4) Of the strategies you have used to cope, which has been most helpful to you and why?; (5) Has the COVID-19 pandemic impacted you in any positive ways? If so, describe; and (6) If you were to give advice to other pregnant or new moms experiencing the COVID-19 pandemic, what would it be?

2.3. Analysis

Quantitative data analyses were conducted using SPSS version 22. Continuous variables were reported using mean and standard deviation values. Frequency (n) and percent (%) were used to summarize categorical variables. Exploratory chi square analyses were conducted to examine proportion of women who engaged in individual coping activities across women with clinically elevated symptoms of depression (EPDS ≥ 13) and those without clinical elevations. Significance was set at $p < .05$.

Qualitative data, comprised of participant narrative responses to the open-ended questions, were analyzed using thematic analysis (Braun and Clarke, 2006). One rater read all responses and developed a preliminary codebook of themes; themes were organized into topic areas related to the initial prompt and content of the responses: (1) Most stressful aspects of COVID/ impact on mental health, (2) Greatest worry about COVID, (3) Most useful coping strategies, (4) Positive experiences

during the COVID-19 pandemic/ silver linings, (5) Advice to other pregnant and postpartum women. A second rater used the codebook to assign themes to narrative responses, and propose modifications, as needed. Once the codebook was finalized, all narrative responses were coded by both raters independently. In cases of disagreement with the initial coding, raters discussed discrepancies in coding to come to consensus. A third rater was used to arbitrate remaining discrepancies if necessary. Ultimately, after all comments were coded, the final list of themes, and representative quotes, was developed.

3. Results

3.1. Demographics and clinical characteristics

Sample characteristics collected at the time of entry to the parent study including age, relationship status, race, ethnicity, education, family income, and other characteristics are summarized in Table 1. Women ranged in age from 22 to 40 years old. Most women were a full time employee or parent (86.7%), held at least a Bachelors-level of education (68.3%), and had a combined family income of \$50,000 or greater (70%). 28.3% of the sample reported that they belonged to a racial/ethnic minority group. In terms of exposure to COVID-19, only one participant reported a positive COVID-19 test and two reported having children who had tested positive for COVID-19. Seven women knew of others who had been hospitalized and/or COVID-related deaths.

Table 1 Demographics.

	M	SD	N	%
Age	32.3	3.8		
Depression^a	10.0	5.7	19	31.7
Anxiety^b	4.3	2.2	22	36.7
Perinatal Status				
Pregnant/Weeks gestation	29.4	8.1	18	30.0
Postpartum/Weeks postpartum	25.7	15.1	42	70.0
Marital status				
Single			10	16.7
Married/partnered			46	76.7
Divorced/widowed			4	6.7
Women with live births before the current pregnancy^c			22	39.2
Currently on maternity leave			16	26.7
Race/Ethnicity				
Caucasian (non-Hispanic)			43	71.7
Black			2	3.3
Asian			1	1.7
Hispanic			9	15.0
Multiracial			5	8.3
Highest education				
High school or less			5	8.3
Some college			14	23.3
Bachelor’s degree			23	38.3
Graduate degree			18	30.0
Employment				
Unemployed			5	8.3
Student			3	5.0
Employed full time			40	66.7
Employed part time			10	16.7
Full time parent			2	3.3
Family income				
<\$24,999			6	10.0
\$25,000-\$49,999			12	20.0
\$50,000-\$99,999			21	35.0
>\$100,000			21	35.3

Note. N = 60. ^a Mean values reflect mean of total sum score of the Edinburgh Postpartum Depression Scale. Number and percentage values reflect number of individuals scoring ≥13 on the scale. ^b Mean values reflect mean of sum score of the anxiety subscale of the Edinburgh Postpartum Depression Scale. Number and percentage values reflect number of individuals scoring ≥6 on this subscale. ^cReflects the number and percentage of participants answering 1 or more to this question.

In general, women rated themselves as very careful in adhering to recommended social distancing efforts (M=6.6 out of 7), and rated others in their household, on average, as slightly less careful than themselves.

3.2. Mental health

Table 2 includes a summary of COVID-19 related impacts on mental health, somatic functioning and stress levels. Based on their SCID interview at enrollment in the parent study, 72% of the sample met criteria for MDD with 58% meeting for recurrent MDD, and nearly half (45%) had experienced a major depressive episode during the current pregnancy. Among women who did not meet criteria for lifetime MDD, 4 (6.7%) met criteria for lifetime minor depressive disorder. 11.9% of women reported at least one prior suicide attempt, and 32% reported a history of non-suicidal self-injury, such as intentionally cutting oneself. At the time of the COVID-19 survey, mean EPDS depression scores were 10.0 (SD=5.7), which is in the moderate range, with 31.7% of women reported clinically elevated depression and 36.7% endorsing clinically elevated anxiety based on the anxiety subscale. The majority of women (76.7%) reported that the pandemic had led to a moderate or significant worsening of their overall mental health, with perceived disruptions to sleep (38.3%) and decreased energy (60%) commonly reported.

3.3. Stress and coping: survey questions

Of 10 potential concerns for pregnant women all except reduced prenatal visits were rated, on average, ≥ 5.0 out of 7 (7= extremely concerning). Mean scores for three out of four postpartum concerns (all except poor postnatal care) were ≥ 5.0 out of 7. Both pregnant and postpartum women identified not being able to care for their infant due to COVID-19 infection as the most concerning issue (pregnant: M=6.4, SD=1.2; postpartum: M=6.0, SD=1.6). These data are summarized in Table 2.

Across nearly all employment-related outcomes, women reported the pandemic affecting their work lives more than their partners' work lives. All but three women (83.3%) experienced one or more COVID-related impact on their employment, such as move to remote work (45.0%), disruptions due to child care challenges (38.3%), increased responsibilities (28.3%) and decreased job security (21.7%). The majority of pregnant (83.3%); and postpartum (57.0%) women reported feeling supported by their prenatal healthcare providers since the pandemic began. The most commonly reported change in labor and delivery plans

related to COVID-19 was not being able to have family members present in the delivery room.

Table 3 summarizes participants' endorsement of coping strategies during the COVID-19 pandemic, including engagement in mental health treatment. Perinatal women in our sample reported using numerous coping strategies for managing stress during the pandemic. On average, women reported employing 7.4 distinct coping strategies, with only one woman (1.7%) not endorsing any coping strategy. The most common strategies, endorsed by one-third or more of the sample, include: talking with friends and family (80.0%), distraction with movies or shows (68.3%), spending time in nature (51.7%). Exercise was endorsed by

Table 3
Use of coping strategies among perinatal women during the COVID-19 pandemic.

	N	%
Currently engaged in mental health treatment	27	45.0
Engages in regular physical activity	31	51.7
Exercising more since pandemic started	14	23.3
Exercising less since pandemic started	37	61.7
Coping Strategies		
Talking with friends or family	48	80.0
Distracting myself with movies or shows	41	68.3
Time in nature	31	51.7
Following the news	26	43.3
Avoiding thinking about what is going on	24	40.0
Getting a good night's sleep	18	30.0
Exercise/physical activity	23	38.3
Isolating/staying to myself	23	38.3
Listening to music	22	36.7
Baking	21	35.0
Wishing things were different	21	35.0
Prayer	20	33.3
Eating other sugary or salty foods	19	31.7
Reading books, magazines, other reading	17	28.3
Healthful eating	14	23.3
Drinking alcohol	12	20.0
Helping others	12	20.0
Creating art, music or crafts	11	18.3
Talking to providers more frequently	10	16.7
Meditation	7	11.7
Doing yoga	7	11.7
Smoking cigarettes/using tobacco	2	3.3
Using marijuana/other drugs	0	0.0

Table 2
COVID-19 related stress and its effects among a clinical sample of perinatal women.

Effects of COVID-19 on Somatic Functioning and Stress Level	Worsened Significantly		Worsened Moderately		No Change		Improved Moderately		Improved Significantly	
	N	%	N	%	N	%	N	%	N	%
Overall mental health	10	16.7	36	60	13	21.7	1	1.7	0	0.0
Sleep	9	15.0	14	23.3	34	56.7	3	5.0	0	0.0
Energy	5	8.3	31	51.7	22	36.7	2	3.3	0	0.0
Overall level of stress (1-7)					M	SD				
Pregnancy/Postpartum Concerns (1-7)					Pregnant	Postpartum				
Reduced prenatal visits					M	SD	M	SD		
Contracting COVID-19 while pregnant					2.9	2.3	–	–		
Pregnancy/birth complications due to COVID-19					6.3	0.9	–	–		
Contracting COVID-19 after birth and not being able to care for baby					5.8	1.6	–	–		
My baby contracting COVID-19 after birth					6.4	1.2	6.0	1.6		
Being separated from partner during delivery					6.3	1.5	5.1	2.1		
Being separated from baby after delivery					5.5	2.0	–	–		
Future health problems for my baby due to COVID-19					5.8	1.7	–	–		
Poor postnatal care					6.1	1.2	–	–		
The ability of family and friends to visit you and your baby					5.0	2.0	2.8	1.8		
					5.3	1.9	5.3	1.9		

over a third of women as a coping strategy, yet many women (61.7%) reported that they were currently exercising less during to the pandemic. At the time of the COVID-19 survey, approximately half of the sample reported regular physical exercise.

3.4. Coping strategies and depression symptoms

Chi square tests of independence showed that women with elevated symptoms of depression were more likely to report using isolation as a coping strategy in comparison with women who do not report elevated depression (OR=4.68, CI=1.47–14.92, $p < .01$). Further, women with elevated symptoms of depression were less likely to endorse spending time in nature as a coping strategy versus women without elevated depression (OR=0.30, CI=0.09–0.94, $p < .05$). No other tests were significant across the remaining coping strategies

3.5. Stress and coping: responses to open-ended questions

Table 4 lists major themes from our qualitative analysis of women’s responses regarding stressors and coping during the pandemic, along with illustrative quotes.

3.5.1. Most stressful aspect of COVID-19 / impact on mental health

Some of the most stressful aspects of COVID-19 for women in this sample included insufficient childcare or lack of support with newborn care (“The loss of support with child care and social support has made me feel depressed at times, and has made my anxiety and perfectionism significantly worse. It has also impacted my marriage and we fight more often”). In addition, women noted unwelcomed changes in prenatal care or plans for labor and delivery (“not having two supports at my delivery is also very discouraging”). Work related stress (“Losing my job and not being able to get a new one”) was also a dominant theme in participants’ responses. Reported effects of COVID-19 on mental health focused on increased anxiety, uncertainty and depression (“The unknowing of what will happen and when it will end;” Especially in first two months, suffered from broken sleep and constant worry about wellbeing of child and husband... Fell into anxiety and depression...”). Less prevalent but still common were themes of reduced self-care (“It has not allowed [me] to do to things that I would normally due to relieve stress, like go to the gym.”).

3.5.2. Greatest worries about COVID-19

Fear of exposure to COVID-19, particularly that which disrupts caregiving was a frequently observed theme (“My greatest worry is that I contract COVID-19 and can no longer see my baby and feed her”). Another common theme was women’s sense of isolation (“I feel isolated and terrified I don’t have what my family needs available for them”). In particular, women were concerned about this in relation to the deterioration of their own mental health (“I have felt very lonely, worrying that after the baby comes home people will not be able to visit out of safety and [my] depression will worsen”). One postpartum woman summarized these themes in her response: “Inability to see physician if needed. Loss of ability to breastfeed or care for child. Loss of ability to exercise to maintain physical health. Loss of social outlets to promote emotional wellbeing.”

3.5.3. Strategies used to cope with COVID-19

Women reported utilizing a wide range of coping strategies, including connecting with others, being outside in nature, engaging in domestic tasks or health behaviors and various means of distraction (“Exercise, healthy eating, and spending time outside...all of these help me stay healthy and have helped my mental state”). Some women reflected that exercise or mental health treatment buoyed them during these times (“Walking and therapy....Time to focus on self”).

Table 4
Themes and representative quotes related to COVID-19 pandemic.

Theme	Representative Quotes
Most Stressful Aspect of COVID-19 / Impact on Mental Health	
Cabin Fever	“Being cooped up at home. I believe this affected my relationship to the point that I am no longer with my baby’s father. I had to move in with my mother... and being cooped up in her house has been extremely stressful.”
Risk/fear of exposure/infection	“It is hard to get out of the house to do anything. It is even difficult to get groceries as I worry about the contact with other people and my baby’s health.”
Financial stress	“Having no income.”; “Being unable to work and provide for my own family.”
Increasing anxiety/uncertainty	“We don’t know a lot of information on what COVID can do to a baby so I want to minimize our risk as much as possible.”; “It has increased my anxiety at times and the unknowns is unsettling.”
Isolation	“I feel isolated”; “Friends and family are a crucial part in helping me maintain a healthy mental state. Being unable to see these people in person has brought more depression.”
Work/school related stressors	“I have had to learn how to deliver telepractice services in a completely different manner ... while being provided insufficient materials to carry out the duties of my profession.”
Lack of childcare/support	“Not having the physical support of family and friends while caring for a newborn. If it weren’t for COVID both my mother and my husband’s mother would have been here to help with diapers and feedings.”
Increased difficulty of daily tasks	“I’m the only parent just going grocery shopping feels like a mission.” “Getting groceries is now a huge deal, baby wipes and diapers were getting sold out in the beginning.”
Delaying/cancelling events	“It was very difficult for me to miss out on a baby shower, and I feel as if my maternity leave from work is being lost out on because everyone is home anyways.”
Reduced self-care	“It has not allowed to do to things that I would normally due to relieve stress like go to the gym or to a coffee shop.”
Greatest Worry	
Caregiving disruptions due to infection	“I contract COVID and can no longer see my baby and feed her (exclusively breast fed)” “I was also worried what would happen if I contracted this illness and was unable to feed my daughter.”
Mental health concerns	“My depression has returned on some days and I feel trapped at home, isolated, and overwhelmed with no chance of help in sight for the near future. This has impacted my mental health & the health of my marriage.”
Reduced in person medical follow-up	“Not having as many in person appointments for myself as I need.” “Inability to see physician if needed.”
Changes in prenatal/Labor plans	“My greatest worry is that my doula won’t be allowed at my delivery-”; “I worry about having to wear a mask during labor. I have had a hard time breathing in them from time to time and I worry I will panic.”
Most Helpful Coping Behavior	
Avoidance	“Avoiding thinking about what is going on with COVID-19 because when I do try to catch up on it, the stress and worry is debilitating.”; “Avoiding the internet, advised by my therapist.”
Domestic Tasks	“Cooking. It reminds me that no matter what I am still able to provide for my family.”
Being in nature	“Getting outside more throughout the day. The fresh air and sun feel so good, and it gets me out of my house”
Connecting with others	“Staying close with family and friends”; “Trying to enjoy the extra time with the baby.”
Distraction	

(continued on next page)

Table 4 (continued)

Theme	Representative Quotes
Health behaviors	“Distracting with movies. It passes the time and helps me think maybe eventually this will all be over”
Exercise	“drinking water, eating healthy” “Exercise and spending time outside because I enjoy those things and they are good distractions.”
Silver Linings	
Spending time with family/re-connecting with friends	“I am absolutely loving (although I hate to admit it!) having this extra time with my baby. I desperately wanted to avoid daycare...I’m absolutely thrilled that I get to observe all his milestones firsthand.”
Increased self-care/health behaviors	“Yes, I practice more self care now than I have in a long time. I spend more time with my dog and husband, I knew that if I didn’t start practicing self care daily I would probably slip into a depression.”
Extended breastfeeding	“I am still breastfeeding and I am very glad I no longer have to pump!”
Advice to Other Moms	
Socialize remotely	“Connect to moms virtually and hang in there!”; “Reach out to as many people virtually as possible.”
Gratitude/be positive	“Be grateful it’s not something worse and just wait it out”
Stay mindful/present	“Take deep breaths and try to stay present.”
Self-care	“Do things you like every day, spend time outside, and enjoy being with your family. It’s also important to carve out alone time in your own space. And take a break from technology.”
Be in nature	“Try to get outside as much as possible, do not spend too much time watching the news or on social media.”
Enjoy time with baby/family	“Focus on the extra time you get with your baby ... US maternity leave is garbage so enjoy these extra weeks.”
Follow pandemic regulations	“Don’t be around where is a lot of people, always used a mask when you are in public.”

3.5.4. Silver linings and advice to other moms

A substantial proportion of women (78%) remarked on positive aspects, or “silver linings” of their experience in the pandemic. Most common was feeling appreciation for increased quality time with their babies and families as a positive consequence of COVID-19, with other themes including increased spousal assistance with childcare (“My husband was working from home when I had the baby so he was able to help me *a lot*”) and extended time to breastfeed (“I’m enjoying getting to see milestones, have extra cuddles, and not having to pump while I’m home with my daughter”). Although some women had previously reported that their self-care had suffered during the pandemic, others reflected that the pandemic had assisted in focusing on their own health (“Yes, I am using my time to improve my health. I am exercising more and eating a lot healthier. I even lost weight.”). In turn, in advice to other mothers, participants focused on encouraging women to engage in behaviors that they had used to cope, including socializing virtually, being in nature, exercise, and self-care (“Be smart, cautious, do your readings. Exercise caution. Don’t go overboard, but do your best. Take care of *yourself*. Eat well. Go for walks.”). Many women included messages emphasizing contemplative practice, including present-moment awareness, staying positive, and gratitude.

4. Discussion

Stressful events are known to impact maternal and child health, and the effects of the COVID-19 pandemic on women’s perinatal experiences and outcomes, including mental health, may be examined for years to come. Women with antenatal depression arguably represent a group at uniquely high risk for poor outcomes. In this study, we assessed

perinatal women with depression histories to understand their perspectives regarding most stressful aspects of the pandemic, worries about the future, and chosen coping strategies. The vast majority of respondents reported a worsening of mental health due to the pandemic, mirroring other samples (Masters et al., 2021; Durankus and Aksu, 2020). However, interestingly, the proportion of women in this sample with currently elevated depression and anxiety was comparable to perinatal community samples, with rates ranging from 33–43% and 29%–57%, respectively (Cameron et al., 2020; Davenport et al., 2020; Fallon et al., 2021; Lebel et al., 2020). The reasons for these relatively comparable rates is not clear. Although women with depression histories would be expected to experience higher levels of symptoms than women from community samples, it is possible that elevated levels of stress and symptoms of anxiety and depression were very commonly experienced among perinatal women – even those not selected for histories of psychological distress. Alternatively, it is possible that participation in clinical trials with relatively active control and wellness intervention arms could have conferred protection against the deleterious impact of the pandemic on perinatal women with histories of depression. However, without comparative studies of rates of elevated symptoms of depression and anxiety among clinical samples of perinatal women who are not enrolled in intervention trials, these conclusions are speculative.

Women’s qualitative responses regarding stressors and coping illustrate specific sources of stress that may lead to increased symptoms of depression and anxiety. In particular, women voiced concerns about major disruptions in employment and childcare that led to increases their daily responsibilities. In responses to survey questions, women reported a perceived impact of the pandemic on home and work responsibilities that was greater than the perceived impact of the pandemic on their partners’ professional and domestic life. These findings mirror reports in academic literature and popular media highlighting the disproportionate occupational and caregiving burden of the pandemic across male and female parents (Miller, 2021; Yildirim and Eslen-Ziya, 2021; Zamorro and Prados, 2021), potentially leaving perinatal women (regardless of relationship status) vulnerable to high levels of psychosocial stress.

In response to questions of greatest worry and toll on emotional health, women cited mounting fear and anxiety, particularly fear of exposure and infection that might interfere with infant care. Similar to Kinser et al.’s (2021) study, women linked these fears with increased distress and worsening mental health. Unlike studies of perinatal women recruited from general community samples, women in this sample frequently mentioned heightened fears of recurrence or worsening of pre-existing forms of psychological distress (e.g., depression, anxiety, post-traumatic stress disorder). Respondents often attributed mental health concerns to disruptions in their preferred mode of coping (e.g., having childcare support, going to the gym) resultant from distancing regulations. It has previously been documented that quarantine during the pandemic may contribute to worsening of mental wellbeing among new mothers (Zanardo et al., 2020). However, this set of pandemic-related stressors may be especially challenging to women who have already experienced some form of depression or perinatal depression, as pandemic restrictions obstruct access to established and effective forms of coping.

Notably, perinatal women in this study reported use of a wide range of coping strategies to manage stress from the pandemic, and approximately half reported engaging in some form of mental health treatment. Beyond treatment-seeking, women’s coping strategies and advice to new mothers were consistent with resilience behaviors reported in other samples, including engaging in self-care, partner emotional support, and gratitude (Farewell et al., 2020; Lebel et al., 2020). Less adaptive strategies, like eating sugary and salty foods and drinking alcohol were also endorsed by a considerable number of women. We note that only postpartum women endorsed using alcohol to cope with pandemic-related stress, suggesting that pregnancy may be protective against alcohol use as a means of coping during the pandemic. Further,

despite reports of surges of alcohol use among women during the pandemic (Pollard et al., 2020), the proportion of women reporting using alcohol to cope (20%) is lower than that among pre-pandemic samples of postpartum women (Chapman and Wu, 2013). The proportion of women in this sample reporting eating comfort foods to cope (32%) was somewhat lower than that of the sample in Kinser et al.'s (2021) study (42%). Considering the long-term potential negative outcomes to mother and infant that may come from substance abuse and maternal obesity, future research should examine coping strategies among perinatal women more closely to understand effective mitigation of stress (and adverse effects of maladaptive coping) in this population.

In this study, two specific coping strategies were associated with levels of depression: self-isolating was associated with increased odds of having elevated depressive symptoms, and spending time in nature was associated with decreased odds of having elevated depressive symptoms. These findings are interesting to note, yet they are not surprising. Social withdrawal is one of the core symptoms of depression and social deficits are often targeted in behavioral treatment. At least one study has linked isolation with increases in depression among pregnant women during the pandemic (Perzow et al., 2021), with another reporting that passive coping strategies (i.e., time on social media) were associated with increased depression and anxiety (Werchan et al., 2021). While we cannot infer causality from the present data and these findings are exploratory in nature, the imposition of physical distancing regulations, alongside the abundance of fears of transmission and infection of COVID-19 by the women in this sample, may have contributed to the tendency for perinatal women to adhere to “very strict” distancing behaviors as well as isolative behaviors which, for some, could have raised risk for worsening mental status and distress.

Our finding that leaving one's home to spend time in nature was associated with lower levels of depression is consistent with prior data showing that spending regular time in nature is associated with reduced risk for a number of health outcomes, including depression, heart disease, and increased social cohesion, particularly when coupled with other lifestyle behaviors such as regular exercise (Shanahan et al., 2016). Other active coping behaviors, including accessing outdoor space and engagement in exercise have also been shown to successfully offset pandemic-related stress among perinatal women (Farewell et al., 2020; Werchan et al., 2021; Preis et al., 2020a). It is possible that, being in nature may be more available to women with greater socioeconomic resources (McEachan et al., 2016). Thus, in this sample, time in nature could be a proxy for generally having greater access to internal and environmental resources.

4.1. Limitations

Study limitations include a relatively small sample and limited generalizability to perinatal women who do not have histories of elevated depression. This sample was comprised of largely well-educated, employed women from a high-income country and largely collected in the first wave of the pandemic. It is likely that these data may differ from other qualitative studies examining determinants of psychological wellbeing of perinatal women from low-income countries during the pandemic, including factors such as inadequate access to hospitals and gynecological care due to hospital overcrowding (Rauf et al., 2021). However, there is evidence that the subjective experience of some stressors such as financial loss and fears of infection are ubiquitous (Rauf et al., 2021). Additionally, we did not assess actual frequency of coping strategies utilized via self-report or observational means, and therefore could not examine the relationship between frequency of coping behaviors and mental status. However, this study is the first to explore the lived experience of women with such histories, who would be presumed to be at greater risk for worsening distress and mental status during the pandemic. By understanding the COVID-specific stressors and coping strategies used by women with prior experience in wellness interventions, we can better inform

prevention strategies to mitigate the effects of current and future shifts in day-to-day living brought about by a public health emergency.

5. Conclusions

In summary, this study provides a window into the lives of perinatal women during the COVID-19 pandemic, in particular those who have significant depression histories. On the whole, women reported drastic changes to their occupational and domestic responsibilities, childcare, social support, and anticipated peripartum experiences. In light of these changes and fears of COVID-19 infection, they reflected concerns regarding their mental health and noted a number of largely adaptive coping strategies that they engaged in to offset these challenges. Importantly, policies imposed at this time (i.e. physical distancing) to reduce risk of infection may simultaneously place them at risk for worsening mental status. Maintaining social connections, and seeking time outdoors in nature may offset risk for depression. Future prospective research may shed light on how perinatal women fare long-term post-pandemic, including impacts on maternal mental and physical health, family stability, maternal-child interactions, and whether pandemic coping behaviors may have any long-term protective effects.

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CRedit authorship contribution statement

Micheline R. Anderson: Formal analysis, Writing – original draft. **Amy L. Salisbury:** Writing – original draft. **Lisa A. Uebelacker:** Data curation, Writing – original draft. **Ana M. Abrantes:** Writing – original draft. **Cynthia L. Battle:** Data curation, Formal analysis, Writing – original draft.

Declaration of Competing Interest

Dr. Uebelacker's spouse is employed by Abbvie Pharmaceuticals. Other authors have no potential conflicts of interest associated with this publication. There has been no significant financial support for this work that could have influenced its outcome.

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