



“Hey child, why were you born when the world is almost over?”: An analysis of first-time mothers’ postpartum experiences during the early stages of the COVID-19 pandemic in Coatepec, Veracruz, Mexico

Emily Jeanne Wolfe-Sherrie¹ · Ana Gabriela Perroni-Marañón² · Alejandra Núñez-de la Mora² · Barbara A. Piperata¹

Accepted: 3 March 2022 / Published online: 22 June 2022

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2022

Abstract

Introduction In Coatepec, Mexico, the immediate postpartum is considered a special time, called the *cuarentena*, when postpartum women receive critical social support and observe diet and activity pre- and proscriptions—all intended to enhance maternal-child health. This study examined how public health mandates aimed at containing COVID-19, which instructed people to socially isolate, affected women’s postpartum experiences, including observing the *cuarentena*.

Methods We recruited first-time mothers from the local public health clinic and collected qualitative data via a verbally administered survey that covered knowledge/perceived threat of COVID-19 and its effect on the *cuarentena* and maternal mood. We used content analysis to analyze the data.

Results We conducted 33 telephonic interviews from March to December 2020. Overall, women were knowledgeable about and receptive to public health messaging regarding COVID-19 risks and safety measures. Despite knowledge and receptivity, most followed their original *cuarentena* plans to observe culturally prescribed postpartum practices, even when doing so contradicted public health mandates. However, the mandates that limited socialization with friends and extended family during the *cuarentena* negatively affected maternal mood.

Discussion Postpartum women, especially in under-studied low- and middle-income countries, merit research attention. Emergent from this study is that public health messaging should speak to its target audience in a way that makes sense within local contexts, which includes consideration of highly valued health practices. Future studies aimed at understanding how to achieve this goal will facilitate development of stronger programs that address public health needs and protect individual well-being.

Keywords Public Health Protocols · Maternal Mental Health · Postpartum Practices · Social Support · COVID-19

Significance

What is already known on this subject? COVID-19 interferes with the uptake of routine healthcare practices and can affect maternal mental health.

What this study adds? This study is the first to demonstrate that COVID-19 public health mandates interfered with traditional postpartum health practices and resulted in both negative mood and modified mandate compliance among first-time Mexican mothers. Understanding how mandates to curb infectious disease spread affect important, but unrelated, health behaviors and outcomes in life-transitioning populations like postpartum women, will facilitate development of stronger programs that address public health needs while simultaneously protecting individual well-being.

✉ Emily Jeanne Wolfe-Sherrie
Wolfe-sherrie.1@osu.edu

¹ Anthropology Department, The Ohio State University, Columbus, OH, USA

² Instituto de Investigaciones Psicológicas, Universidad Veracruzana, Xalapa, Veracruz, MX, Mexico

Introduction

This paper explores how public health mandates consequent to the SARS-CoV-2 (COVID-19) pandemic affect Mexican women's adherence to traditional postpartum practices that promote maternal healing and enhance maternal-infant bonding. Postpartum rituals are ubiquitous and, while specifics vary cross-culturally (Stern & Kruckman, 1983), invariably entail frequent visitation and intense social support—both of which were curtailed by pandemic safety requirements. The full impact of COVID-19 public health mandates on adherence to traditional postpartum practices is unknown.

Postpartum Practices

Cross-culturally, the immediate postpartum is a special time when women rest to recover from the physical demands of pregnancy and childbirth, bond with their infants, and protect mental well-being during a time of social and psychobiological transition (Stern & Kruckman, 1983). Often requiring assistance from others, adherence to culturally defined postpartum practices and receipt of social support has implications for maternal mental well-being (Piperata, 2008). Assistance from others enhances maternal-infant bonding and maternal mood (Kitamura et al., 2004; Ohara et al., 2017), and women who lose access to culturally relevant social support experience higher rates of postpartum depression (Collins et al., 2011). Thus, with social distancing mandates meant to curb the spread of COVID-19, it is unsurprising that the pandemic has had negative impacts on maternal mental health during pregnancy (Durankuş & Aksu, 2022; Moyer et al., 2020; Saccone et al., 2020), and in the postpartum period (Ostacoli et al., 2020).

While commonalities exist, specific postpartum practices vary between populations (Stern & Kruckman, 1983). In Mexico, the postpartum practice called the *cuarentena* is highly valued (Waugh, 2010). Based on our ethnographic fieldwork, we found the 40-day *cuarentena* to be widely practiced within the small town of Coatepec in Veracruz. Specifically, all postpartum women, regardless of parity, are expected to rest and remain in and around their home for the 40-day period. To prevent physical ailments, they are also expected to avoid housework (e.g., sweeping, cooking, washing clothes), heavy lifting, exercise, sexual relations, and quick movements. It is additionally recommended that women lie under warm blankets, wrap bands (*fajas*) around their waist to return organs to the prenatal position, and take herbal baths to prevent ailments such as bone pain. Integrating these practices into daily life requires social support. Thus, it is common during the *cuarentena* for a female relative to temporarily move into the postpartum woman's home

or for the postpartum woman to move into the home of a female relative. In addition to this essential daily support, women receive visitors who welcome the infant, provide companionship, and celebrate the new mother. Adherence to the *cuarentena* is believed essential to women's health and ability to bond with their infants. Inability to practice the *cuarentena* is believed to have negative short- and long-term health consequences including fevers, headaches, and bone pain. Overall, women describe the *cuarentena* as a period during which they feel especially emotionally supported.

COVID-19 Disruption

In late 2019, a new coronavirus (SARS-CoV-2), the cause of COVID-19, was detected in China and quickly blanketed the globe. By March 2020, the World Health Organization (WHO) declared it a pandemic. Highly transmittable, SARS-CoV-2 is a pneumonic pathogen that presents either asymptotically or with a range of flu-like and respiratory symptoms and has a considerably higher mortality rate than the influenzas (Johns Hopkins Medicine, 2021). While the global COVID-19 mortality rate is approximately 2.1%, within Mexico it is nearly 10% (Johns Hopkins University & Medicine, 2021). Symptom severity and high mortality rates placed significant strain on the Mexican healthcare system as facilities struggled to care for the severely ill (Sánchez-Talanquer et al., n.d.). In response, the Mexican government restricted the use of public spaces and social gatherings, and mandated quarantines (Gobierno de México, 2021).

Coatepec enacted a stay-at-home order in mid-March 2020 (Gobierno Municipal Coatepec, 2021), which was enforced by police telling groups of people to go home. Loudspeakers at the centrally located municipal government palace broadcast frequent messages to stay home and send only one household member to shop for essentials. Concurrently, an official car circled the town broadcasting the same message approximately thrice daily. Family members who lived in separate homes were discouraged from gathering, and non-essential businesses, including street vendors, were forced to close. Outdoor spaces were roped off to prevent public gatherings. COVID-19 symptom descriptions and preventative measures were posted in the town center, and essential businesses required face masks to enter. Overall, the state-level message was to isolate to the best of one's ability.

Necessary as these public health mandates are for containing this highly contagious virus, they also disrupt important healthcare practices. For example, in the United States, pediatric vaccination rates declined due to pandemic-related restrictions (Santoli et al., 2020). In the United Kingdom, 60% of parents considered cancelling pediatric vaccinations (Saxena et al., 2020). In Italy, fear of contracting COVID-19

led parents to delay bringing sick children to hospitals, triggering a surge in Intensive Care Unit admissions (Lazzerini et al., 2020). Yet undocumented is the impact of pandemic restrictions on the uptake of healthcare and other health-related practices in low- and middle-income countries, and in particular how they may affect the health behaviors of postpartum women.

Aim

This paper explores how COVID-19-related mandates in Coatepec, Mexico affected the postpartum experiences of first-time mothers. When necessary public health mandates interfere with valued health practices such as the *cuarentena*, understanding the impact better informs decision-makers and guides messaging. Our three research aims are to explore: (1) Whether postpartum women perceive COVID-19 as a threat to their and their infants' health; (2) How the public health mandates affect women's ability to observe the *cuarentena*; (3) How the mandates affect postpartum mood.

Methods

Field Site

The city of Coatepec is the municipal seat and largest community (est. pop. 53,720) within the municipality of Coatepec (est. pop. 93,911) (INEGI, 2021), which, is located in the state of Veracruz. While technically a city, Coatepec is often referred to as a town; it was named a *Pueblo Mágico* in 2006 by a government initiative to encourage tourism by promoting the beauty and culture of Mexican 'towns.' Coatepec is small with two main hubs for obtaining groceries, one main park where people socialize, and one hospital.

Sample and Recruitment

At the onset of the COVID-19 pandemic, Authors 1 and 2 were in Coatepec collecting data for a larger project examining the *cuarentena* and maternal mental health. We collected the COVID-19 data post hoc from March through December 2020. As part of the larger project, we recruited 48 pregnant women from the waiting room and pregnancy and infant-care workshops (*pláticas*) at the *Centro de Salud Coatepec* clinic which primarily serves lower socio-economic-status individuals. When COVID-19 protocols required cancellation of the *pláticas* and patient visits were reduced, we phoned the previously recruited women once they were postpartum; 33 agreed to participate in this study and saturation was reached. Inclusion criteria included:

primiparous, Coatepec-born, ≥ 18 years, and no history of prolonged depression. All women gave verbal consent prior to data collection. Participants were not compensated for participation.

Data Collection

At approximately 40 days postpartum (i.e., post-*cuarentena*; range: 40–55 days), the first two authors together interviewed participants telephonically. The interview included a demographic and 21-question verbally administered COVID-19 survey, developed by all authors. The first two authors recorded, transcribed, and translated the Spanish survey responses into English for analysis; the survey took approximately 20 min to administer, ranging from 15 to 40 min.

The COVID-19 survey addressed women's perceived threat of COVID-19 (*Research Aim 1*). We asked questions that explored viral spread knowledge, information sources, safety practices, and fear of infection for themselves and their infants. All questions were open-ended, aside from fear of infection which was scored on a scale of 1 (low) to 5 (high).

We also asked open-ended questions that explored how women perceived the COVID-19 related health mandate to affect *cuarentena* adherence (*Research Aim 2*). For example, we asked how postpartum plans were affected, including decisions on where to live, whether they received visitors and with whom they visited, and whether the pandemic quarantine affected decisions about infant checkups and vaccines. For *Research Aim 3* we asked, "In what ways has the COVID-19 quarantine affected your mood?"

Data Analysis

Authors 1 and 2 analyzed the data. For the one closed-ended response, we tabulated frequencies. For open-ended responses, we used content analysis, an established framework to analyze qualitative transcripts (Bernard, 2006). Both authors identified commonalities between responses and created coding units. For example, "It is something very difficult and sad because you cannot see family" was coded "feeling sad from missing family." Codes were then organized into categories; this quote was categorized under "affected mood" and "reasons for affected mood." Subcategories were then created, such that "sadness" was a subcategory of "affected mood," and "missing family" was a subcategory of "reasons for affected mood." We report frequency of responses in each category and subcategory and include illustrative quotations with pseudonyms.

Institutional Review Boards at The Ohio State University (Protocol # 2019B0219) and the Instituto de

Ciencias de la Salud at Universidad Veracruzana (Registration # 30CEI00120180131) approved this project. We followed the COREQ criteria for reporting qualitative research (Tong et al., 2007).

Results

The 33 women ranged in age from 18 to 30 years (23 ± 3.9 years). The majority ($n=27$) identified as Catholic. Of the nine who were employed, four worked from home, none as primary household earners. Eleven women completed school grades 7–9, 10 completed grades 10–12, and 12 had some level of post-high school education. Nearly all reported that they had a partner ($n=32$), although five of the couples were not living together. Our preliminary work showed that in this context and during the *cuarentena*, women valued female support over that of their partners; all but one of the women lived with at least one female family member.

Research Aim 1: Postpartum women’s perceptions of COVID-19 as a threat

Analysis of open-ended responses regarding *virus transmission* knowledge revealed 12 transmission modes and seven information sources (Table 1). The majority ($n=26$) listed three or more transmission modes, most of which were consistent with public health announcements. Analysis revealed nine *adopted preventative measures* (Table 2). On average,

Table 1 COVID-19 Transmission Modes and Information Sources ($n=33$)

Transmission Modes	N
Contact with other people	18
No social distance	10
Sneezing and/or coughing	10
No hand washing nor antibacterial gel	9
Airborne/not using face mask	9
Saliva	9
Contaminated surfaces	6
Leaving the house	4
Viral/flu-like spread	4
Greetings (kisses, hugs, handshakes)	3
Touching nose or mouth	3
Bad hygiene	2
Unknown	4
Information Sources	
Television	23
Internet	16
Unidentified news outlets	10
Friends/family	8
Health clinic	7
Store announcements/street posters	5
Radio	4

Table 2 Adopted COVID-19 Preventative Measures ($n=33$)

Preventative Measures	N
Face masks	28
Hand hygiene	26
Washing themselves and/or changing clothes/shoes before re-entering the home	17
Staying home unless necessary for purchasing food, paying bills, or visiting the clinic	16
Disinfecting/cleaning the home or purchased products	15
Not receiving visitors	2
Social distancing	2
Assigning one household member to run errands	1
Not touching their face	1

women adopted three preventative measures to avoid contracting the virus. Using a 5-point scale (1 = low to 5 = high), the women rated their fear of personal infection and infant infection (Table 3). Over half ($n=18$) reported greater fear for their infants (median 5) than for themselves (median 3).

Research Aim 2: COVID-19 public health mandates’ effects on the ability to observe the *cuarentena*

Most women ($n=23$) reported that the health mandates did not alter their ability to follow *cuarentena* pre- and proscriptions, with several explaining that since the *cuarentena* prescribes resting at home the difference was minimal. Moreover, 31 reported they received sufficient social support during the *cuarentena* as family members assisted with household chores, herbal baths, *fajas*, and childcare tasks and instruction. For example, 29 women completed the herbal baths and 24 used *fajas*; all baths were given by either the participant’s mother, mother-in-law, or aunt.

When asked whether public health mandates against combining households affected living arrangement decisions, most reported it did not ($n=31$). As planned for their *cuarentena*, women either remained in their homes ($n=22$), moved to their mother’s or mother-in-law’s homes ($n=6$), or had their mothers move in with them ($n=3$).

Another important aspect of the *cuarentena* is receiving visitors to greet the new mother-infant pair, as our preliminary research found that visitors provide emotional support to postpartum women. Ten of the 33 women did not receive visitors whatsoever. Lupita chose not to receive visitors; she stated:

My friends want to know my baby, and their nephew [reference to aunts/uncles], but nobody has come and we have to say ‘no’ for now because it is not recommended that they come.

Anahí wanted visitors, but nobody came:

I would have received visitors but could not. I did not receive visitors because of COVID and because people were not willing to leave [their houses].

Almost half ($n = 16$) of the women reported receiving fewer visitors than desired, while seven reported receiving “many” visitors despite the pandemic. Further, for women who reported that COVID-19 impacted their decisions about *who* can visit ($n = 20$), precautions included: only receiving family members, not allowing individuals with illness symptoms or limiting visitation to only a few individuals at a time.

The majority of women ($n = 21$) reported the mandated quarantine affected decisions about taking their infant to visit friends or family. Rosario explained:

We do not leave. But, if I leave, I do not take my daughter because I use a face mask but not everybody does, and so the baby cannot come outside.

Aimé expressed why she keeps her infant at home:

Because I am scared, and I do not have the same trust for them [other people].

In addition to Rosario and Aimé, 11 others chose to keep their infants at home. For women who did take their newborns out, precautions included: avoiding crowded places, avoiding public transportation, only visiting the health clinic, and only visiting others who take precautions or do not exhibit COVID-19 symptoms.

Traditionally, infants are taken for postpartum check-ups and vaccines during the *cuarentena*, and most women ($n = 24$) reported the COVID-19 quarantine did not affect their decisions to do so. However, Federica said:

I had an appointment at noon and arrived at 11. They did not see me until 3:30 in the afternoon. There were a lot of people, and I was worried for my daughter. Because there were a lot of people there, and the only person who could enter was the one with an appointment. My partner was annoyed. We do not want to go again. I did not have that experience before COVID.

Similar to Federica, nine other women reported concerns about limited staff, long wait times, and crowded conditions which led them to avoid these and future appointments. Ten expressed concerns about insufficient vaccines/doctors.

Research Aim 3: COVID-19 public health mandates' effects on postpartum mood

Over a quarter of women ($n = 9$) reported no negative impact of the COVID-19 quarantine on their mood; Milena stated the COVID-19 quarantine allowed more time with her son than she might otherwise have had. While Alanna reported that she felt unaffected, she playfully told her infant, “Hey child, why were you born when the world is almost over?”

Most women ($n = 24$) reported their mood was negatively affected by the COVID-19 quarantine. For the affected women, content analysis revealed one or more of the following reported moods: apprehension (i.e., worry, fear, stress, anxiety; $n = 14$), sadness/depression ($n = 11$); discomfort ($n = 5$), frustration/anger ($n = 4$), and boredom/restlessness ($n = 3$).

The most common reason ($n = 10$) for why the COVID-19 quarantine had a negative impact on mood was the *restrictions on visiting with friends and family*. As Lupita described:

It is something very difficult and sad because you cannot see family. You cannot leave, you cannot buy things, you cannot take the baby outside of the house, and I am far from family... I missed my family a lot

In addition to family, Martha missed her friends:

My mood in general is sad because I would like to share [her infant] with family and friends. I want the congratulations from friends.

Similar to Martha, Mercedes wanted to feel celebrated:

Well, it is a difficult because you cannot leave or have parties or meet people, nor leave a lot. I could not have a photo session for my baby or have a party for my baby.

Overall, women missed receiving company and attention for their newborns.

Almost as many ($n = 8$) reported an *inability to leave* the home as affecting their mood. Sofia said:

It has affected my mood a lot. I felt like I was going into depression and it was very stressful that I could not leave. With COVID everything is closed, and it is stressful.

Even the central park, where people typically socialize, was taped off. In addition to issues with public closures, as Sofia demonstrated, Diana felt affected by store restrictions:

Well, I am a little worried about not being able to leave. And when I need to leave to go shopping, for example, with my daughter there are places that I cannot enter with her. This is the only problem I have right now. There are many places that do not let me enter with her. For that, I have to look for someone to take care of her.

In addition to store restrictions, the health clinic cancelled the *pláticas*, which concerned Karla:

Well, I could not go to the *pláticas* at the clinic for pregnant women, and I feel that I missed them. And my mom tells me, like when my baby cries and I ask what do I do? But it does not feel the same as at the *pláticas* and maybe it would be easier if I had gone.

COVID-19 also affected women's mood via its *economic impact*. Many reported household job insecurity (n=6). Nerli stated:

It is difficult in the economic part. For example, I cannot buy new clothes for my daughter. All of the clothes my baby has are gifts because my husband is without work... I would like to have a baby shower for me, but I did not have it for the same reason [economic].

While none reported food insecurity or inability to pay rent, many were unable to afford desired things for their newborn or have celebrations. Additionally, Carlye felt sad because the economic impact affected her birth plans:

I was thinking that I would have my birth in a private hospital, and I went to a private gynecologist. I went to a private one but then left that one because we did not have work anymore...

Five of the women reported that *fear of the virus* negatively affected their mood. Aimé said:

I am a little scared of how it will affect my son, or me infecting my son if I get it from somewhere. I am scared that if I have to go to the hospital for something else we might get sick...

As indicated above, women were apprehensive about accessing the clinic and worried about loved ones becoming ill.

Discussion

Three important findings emerged from this study of how the COVID-19 pandemic affected postpartum women in Coatepec. First, women were knowledgeable about and receptive to public health messaging regarding risks and safety measures. Second, despite knowledge and receptivity, most kept their original *cuarentena* plans to observe culturally prescribed postpartum practices, even when doing so went against public health mandates. Third, adherence to public health mandates that limited socialization with friends and extended family during the *cuarentena* negatively affected mood.

To curb the spread of any pandemic, it is useful to examine the mechanisms driving compliance with public health mandates. Among our sample in Coatepec, public health messaging seemed to effectively explain COVID-19 transmission and preventative measures—an important finding given that when individuals understand disease transmission, they are more likely to adopt preventative measures (Hewlett & Amola, 2003; Parveen et al., 2016). Participants' fear of contracting the virus also likely had a positive impact on behavioral compliance, as has been found for seasonal influenza (Barr et al., 2008; Meharry et al., 2013); equipping women with knowledge may facilitate their ability to navigate risks in a meaningful and conscientious manner to fulfill cultural, emotional, and financial needs. Furthermore, this study occurred early in the pandemic when fear was high, especially for primiparous postpartum women. Follow-up studies should examine later points in the pandemic and include mothers of older infants who may be viewed as less vulnerable—does fear continue to have a meaningful impact on behavioral compliance?

Despite public health mandates discouraging mingling of households, study participants moved into female relatives' homes as planned. However, once there, they limited socialization. Most reported that limiting socialization contributed to negative mood. Inability to socialize, combined with feeling “stuck” and pandemic-related economic strain, can elevate risk of depressive symptoms beyond that attributable to normative postpartum mood fluctuation (Brooks et al., 2020). Given that COVID-19 exacerbates maternal postpartum depressive symptoms (Zanardo et al., 2020) and that maternal dysphoria can increase infant mortality and morbidity (Weobong et al., 2015), the mental health of postpartum women should be considered when designing public health policies. Mandates that are minimally discordant with cultural practices (e.g., Hewlett & Amola, 2003), are likely to increase compliance and protect mental health. Preliminary support for this position comes from New Zealand which successfully encouraged social bubbles rather than isolative social distancing (Trnka & Davies, 2021).

Public health mandates that are mindful of local cultural norms and practices may provide the most effective means of curbing the spread of COVID-19, while protecting mental health (e.g., Hewlett & Amola, 2003).

Our findings also highlight healthcare access challenges consequent to the COVID-19 pandemic. Consistent with prior work (Lazzerini et al., 2020), many Coatepec participants reported fear of attending health clinics for infant checkups and recommended vaccinations. This fear is problematic considering that data from low- and middle-income countries (LMIC), including 34 within Latin American/Caribbean region, predicted an additional 168,000 neonatal and 28,000 maternal deaths per year due to a pandemic-driven 10% reduction in essential maternal and child health services (Castro, 2020). Additionally, cancellation of the *pláticas* distressed some women as these workshops provided both education and support. Unlike elsewhere where pregnant women were offered online classes when in-person classes were canceled (Burgess et al., 2021), women in Coatepec were provided no alternatives. While online learning is unfeasible in this and other low resource settings (e.g., Myhre & Flora, 2000), classes could be televised as that is how most women in Coatepec effectively learned about COVID-19. Creative solutions amenable to local constraints could improve efficacy of messaging.

The strength and scope of this study was limited by post hoc design while in the field during the start of the pandemic while conducting a larger ad hoc project. Thus, the data collected was limited to that which could reasonably be asked of our participants in the context of our larger project. In addition, the pandemic restrictions that required we shift from planned in-person to telephonic interviews prevented us from probing risky topics such as domestic violence that risked placing respondents in danger, given we could not ensure the privacy of the conversations on their end. Sample size was also severely constricted due to pandemic conditions. Future research on this topic should probe further into the nuances of participants' decision-making, risk assessment, and parenting strategies as they may be affected by postpartum mood. It will also be informative to explore additional dimensions of women's fear regarding infants' health and, assuming safe circumstances, the role of current and past domestic violence in their postpartum experience.

Postpartum women, especially in under-studied LMIC, merit research attention (Kumar & Kumar, 2021). Despite the small sample size, this study is an important step to that end. With the frequency of epidemics and pandemics likely to increase (Smith et al., 2014), it is important to refine our ability to elicit compliance with safety recommendations. Emergent from this study and others over the past year is that public health messaging should speak to its target audience in a fashion that makes sense within local contexts. Future

Table 3 Number of Women Endorsing Level of Fear of Infection for Self and Infant (n = 33)

Fear	Self (N)	Infant (N)
1 (low)	7	4
2	3	2
3	7	0
4	7	1
5 (high)	9	26

studies aimed at understanding how to achieve this goal will facilitate development of stronger programs that address public health needs and protect individual well-being.

Acknowledgements The authors would like to thank all the women who shared their personal experiences as well as the health professionals and director, Dr. José Ignacio Contrenas Vázquez at the Coatepec public health clinic. This research was supported by a National Science Foundation Doctoral Dissertation Research Improvement Grant (Award #: 1942841).

Authors' contributions Wolfe-Sherrie—instrument design, data collection, analysis, original manuscript draft; Piperata—instrument design, original manuscript draft; Núñez-de la Mora—instrument design, manuscript draft edits; Perroni-Marañón—data collection, analysis.

Funding This project was funded by the National Science Foundation Doctoral Dissertation Research Improvement Grant in the Biological Anthropology Program. Award #: 1942841.

Availability of data and material The datasets generated by the current study are not publicly available due to the sensitive nature of the content, but are available from the corresponding author upon reasonable request.

Code Availability N/A.

Declarations

Conflicts of interest/Competing interests: The authors declare that they have no conflict of interest.

Ethics approval This project was approved by both the Institutional Review Boards at The Ohio State University (Protocol # 2019B0219) and the Instituto de Ciencias de la Salud at Universidad Veracruzana (Reference # 30CEI00120180131) in Mexico.

Consent to participate Following IRB protocol, participant verbal consent was obtained prior to participation in the study.

Consent for publication Following IRB protocol, and prior to participant consent, we explained the study procedures and explained that the results would be published with participant information de-identified.

References

- Barr, M., Raphael, B., Taylor, M., Stevens, G., Jorm, L., Giffin, M., & Lujic, S. (2008). Pandemic influenza in Australia: Using telephone surveys to measure perceptions of threat and willingness

- to comply. *BMC Infectious Diseases*, 8(1), 117. <https://doi.org/10.1186/1471-2334-8-117>
- Bernard, H. R. (2006). *Research Methods in Anthropology: Qualitative and Quantitative Approaches* (4th ed.). AltaMira Press
- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, 395(10227), 912–920. [https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8)
- Burgess, A., Breman, R. B., Bradley, D., Dada, S., & Burcher, P. (2021). Pregnant women's reports of the impact of COVID-19 on pregnancy, prenatal care, and infant feeding plans. *MCN: The American Journal of Maternal/Child Nursing*, 46(1), 21–29. <https://doi.org/10.1097/NMC.0000000000000673>
- Castro, A. (2020). Desafíos de la pandemia de COVID-19 en la salud de la mujer, de la niñez y de la adolescencia en América Latina y el Caribe. *PNUD América Latina y el Caribe, Unicef, COVID19*. <https://www.unicef.org/lac/media/16356/file/cdl9-pds-number19-salud-unicef-es-003.pdf>
- Collins, C. H., Zimmerman, C., & Howard, L. M. (2011). Refugee, asylum seeker, immigrant women and postnatal depression: Rates and risk factors. *Archives of Women's Mental Health*, 14(1), 3–11. <https://doi.org/10.1007/s00737-010-0198-7>
- Durankuş, F., & Aksu, E. (2022). Effects of the COVID-19 pandemic on anxiety and depressive symptoms in pregnant women: A preliminary study. *The Journal of Maternal-Fetal & Neonatal Medicine*, 35(2), 205–211. <https://doi.org/10.1080/14767058.2020.1763946>
- Gobierno de México (2021). *Semáforo COVID-19*. Retrieved March 30, 2020, from <https://coronavirus.gob.mx/semáforo/>
- Gobierno Municipal Coatepec (2021, December 30). *COVID-19 Coronavirus*. COVID-19 Coatepec. Retrieved March 30, 2020, from <https://sites.google.com/view/covid19coatepec/inicio?authuser=1>
- Hewlett, B. S., & Amola, R. P. (2003). Cultural contexts of Ebola in northern Uganda. *Emerging Infectious Diseases*, 9(10), 1242. <https://doi.org/10.3201/eid0910.020493>
- Johns Hopkins Medicine (2021, May 7, 2021). *Coronavirus Disease 2019 vs. the Flu*. Retrieved May 9, 2021, from <https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/coronavirus-disease-2019-vs-the-flu>
- Johns Hopkins University & Medicine (2021). *COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU)*. Retrieved May 9, 2021, from <https://coronavirus.jhu.edu/map.html>
- Kitamura, T., Takauma, F., Tada, K., Yoshida, K., & Nakano, H. (2004). Postnatal depression, social support, and child abuse. *World Psychiatry*, 3(2), 100–101
- Kumar, J., & Kumar, P. (2021). COVID-19 pandemic and health-care disruptions: Count the most vulnerable. *The Lancet Global Health*, 9(6), e722–e723. [https://doi.org/10.1016/S2214-109X\(21\)00098-X](https://doi.org/10.1016/S2214-109X(21)00098-X)
- Lazzerini, M., Barbi, E., Apicella, A., Marchetti, F., Cardinale, F., & Trobia, G. (2020). Delayed access or provision of care in Italy resulting from fear of COVID-19. *The Lancet Child & Adolescent Health*, 4(5), e10–e11. [https://doi.org/10.1016/S2352-4642\(20\)30108-5](https://doi.org/10.1016/S2352-4642(20)30108-5)
- Meharry, P. M., Colson, E. R., Grizas, A. P., Stiller, R., & Vázquez, M. (2013). Reasons why women accept or reject the trivalent inactivated influenza vaccine (tIV) during pregnancy. *Maternal and Child Health Journal*, 17(1), 156–164. <https://doi.org/10.1007/s10995-012-0957-3>
- Moyer, C. A., Compton, S. D., Kaselitz, E., & Muzik, M. (2020). Pregnancy-related anxiety during COVID-19: A nationwide survey of 2740 pregnant women. *Archives of Women's Mental Health*, 23, 757–765. <https://doi.org/10.1007/s00737-020-01073-5>
- Myhre, S. L., & Flora, J. A. (2000). HIV/AIDS communication campaigns: Progress and prospects. *Journal of Health Communication*, 5(sup1), 29–45. <https://doi.org/10.1080/108107300126731>
- Ohara, M., Okada, T., Aleksic, B., Morikawa, M., Kubota, C., Nakamura, Y. ... Ozaki, N. (2017). Social support helps protect against perinatal bonding failure and depression among mothers: A prospective cohort study. *Scientific Reports*, 7(1), 9546–9553. <https://doi.org/10.1038/s41598-017-08768-3>
- Ostacoli, L., Cosma, S., Bevilacqua, F., Berchiolla, P., Bovetti, M., Carosso, A. R. ... Benedetto, C. (2020). Psychosocial factors associated with postpartum psychological distress during the Covid-19 pandemic: A cross-sectional study. *BMC Pregnancy and Childbirth*, 20(1), 1–8. <https://doi.org/10.1186/s12884-020-03399-5>
- Parveen, S., Islam, M. S., Begum, M., Alam, M. U., Sazzad, H. M., Sultana, R. ... Luby, S. P. (2016). It's not only what you say, it's also how you say it: Communicating nipah virus prevention messages during an outbreak in Bangladesh. *BMC Public Health*, 16(1), 1–11. <https://doi.org/10.1186/s12889-016-3416-z>
- Piperata, B. A. (2008). Forty days and forty nights: A biocultural perspective on postpartum practices in the Amazon. *Social Science & Medicine*, 67(7), 1094–1103. <https://doi.org/10.1016/j.socscimed.2008.05.031>
- Sacone, G., Florio, A., Aiello, F., Venturella, R., De Angelis, M. C., Locci, M. ... Sardo, A. D. S. (2020). Psychological impact of coronavirus disease 2019 in pregnant women. *American Journal of Obstetrics & Gynecology*, 223(2), 293–295. <https://doi.org/10.1016/j.ajog.2020.05.003>
- Sánchez-Talanquer, M., González-Pier, E., Sepúlveda, J., Abascal-Miguel, L., Fieldhouse, J., del Río, C., & Gallalee, S. (n.d.). *Mexico's Response to COVID-19: A Case Study*. Institute for Global Health Sciences. Retrieved January, 10, from <https://globalhealthsciences.ucsf.edu/sites/globalhealthsciences.ucsf.edu/files/mexico-covid-19-case-study-english.pdf>
- Santoli, J. M., Lindley, M. C., DeSilva, M. B. K., Elyse, O., Daley, M. F., Galloway, L. ... Weintraub, E. (2020). Effects of the COVID-19 pandemic on routine pediatric vaccine ordering and administration—United States, 2020. *Morbidity and Mortality Weekly Report (MMWR)*, 69(19), 591–593. <https://doi.org/10.15585/mmwr.mm6919e2>
- Saxena, S., Skirrow, H., & Bedford, H. (2020). Routine vaccination during covid-19 pandemic response. *BMJ*, 369, m2392. <https://doi.org/10.1136/bmj.m2392>
- Smith, K. F., Goldberg, M., Rosenthal, S., Carlson, L., Chen, J., Chen, C., & Ramachandran, S. (2014). Global rise in human infectious disease outbreaks. *Journal of the Royal Society, Interface*, 11(101), 20140950. <https://doi.org/10.1098/rsif.2014.0950>
- Stern, G., & Kruckman, L. (1983). Multi-disciplinary perspectives on post-partum depression: An anthropological critique. *Social Science & Medicine*, 17(15), 1027–1041. [https://doi.org/10.1016/0277-9536\(83\)90408-2](https://doi.org/10.1016/0277-9536(83)90408-2)
- Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19(6), 349–357. <https://doi.org/10.1093/intqhc/mzm042>
- Trnka, S., & Davies, G. S. (2021). Blowing Bubbles: COVID-19, New Zealand's bubble metaphor, and the limits of households as sites of responsibility and care. In M. J. Ryan (Ed.), *COVID-19: Two Volume Set* (pp. 167–184). Routledge
- Waugh, L. J. (2010). *La Cuarentena: An Ethnographic Study of Mexican Immigrant Families Postpartum* [Dissertation, University of Colorado Denver]. Denver, CO
- Weobong, B., ten Asbroek, A. H., Soremekun, S., Gram, L., Amenga-Etego, S., Danso, S. ... Kirkwood, B. R. (2015). Association between probable postnatal depression and increased infant

mortality and morbidity: Findings from the DON population-based cohort study in rural Ghana. *BMJ Open*, 5(8), 1–9. <https://doi.org/10.1136/bmjopen-2014-006509>

World Health Organization (2020). *Archived: WHO Timeline - COVID-19*. Retrieved May 9, 2021, from <https://www.who.int/news/item/27-04-2020-who-timeline---covid-19>

Zanardo, V., Manghina, V., Giliberti, L., Vettore, M., Severino, L., & Straface, G. (2020). Psychological impact of COVID-19 quarantine measures in northeastern Italy on mothers in the immediate postpartum period. *International Journal of Gynecology & Obstetrics*, 150(2), 184–188. <https://doi.org/10.1002/ijgo.13249>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.