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Research Article

# Mental Health and Meditation Practices of Pregnant Women during COVID-19

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## Abstract

**Introduction:** The purpose of this paper was to describe pregnant women's COVID-19 perceptions, mental health and meditation habits compared to non-pregnant women in a sample of meditation mobile app subscribers.

**Methods:** Women completed the "COVID-19 Health and Well-being Survey" which assessed perceptions of COVID-19 (i.e., worry, attention to news, stress from social distancing), perceived stress, post-traumatic stress disorder (PTSD), anxiety and depression, and meditation habits. Propensity scores were used to match the five most similar non-pregnant women to each pregnant woman based on racial minority status, ethnicity, age, household income, education, and residence in a state with a high COVID outbreak rate. Perceptions of COVID-19, mental health, and meditation habits were compared using *t*-tests and chi-square tests.

**Results:** Of the 6,157 respondents, 50 were pregnant. The sample was mostly White (88.89%) with a mean age of 37.69 (*SD*=11.20). Pregnant women were more worried about getting COVID-19 than non-pregnant women and felt that they were taking more precautionary measures to prevent infection. Compared to non-pregnant women, pregnant women had less severe symptoms of depression and PTSD. The amount/frequency of meditation declined during the pandemic ($t$=2.31, $p$=.02). Pregnant women reported weaker pre-COVID-19 meditation habits, but larger increases in strength of meditation habits during the pandemic.

**Discussion:** The strength of mediation habits may play a role in pregnant women's mental health during COVID-19. Stronger meditation habits may prevent increases in stress despite increased worry related to getting infected by COVID-19 and may reduce symptoms of depression and PTSD.

**Keywords:** Coronavirus; Depression; mHealth; Pregnancy; Women's Health

## 1. Introduction

The COVID-19 pandemic may exacerbate rates of perinatal mental health problems because of quarantine mandates, social-distancing guidelines, and restricted access to prenatal care all of which limits needed support and services [1, 2]. One study in pregnant and postpartum women reported 40.7% and 72% of the sample identified as having depression or anxiety during the pandemic while pre-pandemic rates were as low as 15% and 29% respectively [3]. Mental health disorders during pregnancy are linked to adverse birth outcomes including (but not limited to) low birth-weight infants and preterm delivery [4]. Pregnant women are a vulnerable group who are advised to take additional precautions to minimize risk of infection of COVID-19 which may contribute to anxiety and worry [2, 5, 6]. Pregnant women need effective strategies to manage mental health especially during the COVID-19 pandemic.

The evidence supporting the use of mindfulness meditation mobile applications (apps) for improving mental health is promising [7] and may be particularly helpful for self-managing mental health during COVID-19 while maintaining quarantine and social distancing guidelines. However, meditation behaviors of pregnant women during the pandemic is unknown. The purpose of this paper was to describe pregnant women's COVID-19 perceptions (i.e., worry about COVID-19), mental health and meditation habits compared to non-pregnant women in a sample of meditation mobile app subscribers.

## 2. Materials and Methods

This was a secondary analysis of pregnant and non-pregnant women who completed a cross-sectional survey called the "COVID-19 Health and Well-being Survey." This study was approved by the Arizona State University Institutional Review Board (STUDY00011867) and all participants provided their electronic consent to participate. Participants in this study were adult paying subscribers to the consumer-based mindfulness meditation app, Calm and completed the survey between April 22nd and June 3rd, 2020. More detail about the survey is reported elsewhere [8]. Subscribers were eligible to complete the survey if they were (1) at least 18 years old, (2) able to read and understand English, and (3) had used at least one sleep component of the Calm app in the previous 90 days. Subscribers received an email inviting them to answer a survey regarding their use of Calm.

### 2.1 Measures

The COVID-19 Health and Well-being Survey was an investigator-developed survey to assess perceptions of COVID-19 (i.e., worry, attention to news, stress from social distancing), perceived stress (Perceived Stress Scale; PSS) [9, 10], post-traumatic stress disorder (Impact of Events Scale; IES-6) [11], anxiety and depression (Hospital Anxiety and Depression Scale; HADS) [12]. and meditation habits (Self-report Habit Index; SRBAI) [13]. Demographics and health characteristics including pregnancy status were collected at the end of the survey.

### 2.2 Statistical analysis

The SPSS FUZZY extension [14] was used to calculate propensity scores to identify the five most similar non-

pregnant women (n=250) for each pregnant woman (n=50). Matching was based on racial minority status, ethnicity, age, household income, education, and residence in a state with a high COVID outbreak rate at the time of the survey (binary). Perceptions of COVID-19, mental health, and health behaviors were compared using *t*-tests and chi-square tests.

## 3. Results

Of the 6,157 female survey respondents, 50 reported being pregnant. The sample was mostly White (88.89%) and non-Hispanic (93.26%), with a mean age of 37.69 (*SD*=11.20). One third (33.70%) lived in a state with high rates of COVID-19 spread. There were no differences in matching variables across groups (all p>0.24).

### 3.1 COVID-19 perceptions, mental health and meditation habits

Pregnant women were more worried about getting COVID-19 than non-pregnant women and felt that they were taking more precautionary measures to prevent infection (see Table 1). There were no differences in worry about family members getting COVID-19, the spread of COVID-19 in their area, and pregnant women did not perceive themselves to be at greater risk of getting COVID-19 or perceive it to be less preventable that other infectious diseases (e.g., flu). Pregnant and non-pregnant women did not differ related to how much they believed that COVID-19 had impacted their stress, mental health, or physical health. Compared to non-pregnant women, pregnant women had less severe symptoms of depression and PTSD (see Table 1), but there were no differences in perceived stress or anxiety.

Overall, the amount/frequency of meditation declined during the pandemic (*t*=2.31, *p*=.02). There were no differences between pregnant and non-pregnant women who reported meditating pre-COVID-19 (pregnant=86.00%, non-pregnant=73.18%, $\chi^2$=3.62, *p*=.06) or currently (pregnant=58.00%, non-pregnant=65.45%, $\chi^2$=0.98, *p*=.32), or in changes in the amount/frequency of meditation since the beginning of the pandemic (see Table 1). Pregnant women reported weaker pre-COVID-19 meditation habits, but larger increases in strength of meditation habits during the pandemic, such that current habit strength did not differ across groups.

| **Outcomes** | **Not Pregnant M (SD)** | **Pregnant M (SD)** | **Comparison** | ***p*** |
|---|---|---|---|---|
| **Perceptions of COVID-19** | | | | |
| Personal risk of getting COVID-19 | 1.01 (0.07) | 0.95 (0.14) | *t*=-0.35 | *p*=.73 |
| Ability to prevent getting COVID-19, compared to other diseases | 0.99 (0.07) | 0.96 (0.14) | *t*=1.17 | *p*=.24 |
| Worry about personally getting COVID-19 | 1.10 (0.07) | 1.13 (0.16) | *t*=-4.07 | *p*=.00 |
| Worry about family getting COVID-19 | 1.16 (0.08) | 0.95 (0.13) | *t*=-0.08 | *p*=.94 |
| Worry about local spread of COVID-19 | 1.26 (0.09) | 1.10 (0.16) | *t*=0.57 | *p*=.57 |
| Precautionary behaviors to prevent getting COVID-19 | 1.50 (0.10) | 0.99 (0.14) | *t*=-2.33 | *p*=.02 |
| Perceived impact of COVID-19 on stress | 1.65 (0.75) | 1.82 (0.72) | *t*=-0.66 | *p*=.51 |
| Perceived impact of COVID-19 on mental health | 1.89 (0.81) | 1.92 (0.78) | *t*=-0.73 | *p*=.47 |

| | | | | |
|---|---|---|---|---|
| Perceived impact of COVID-19 on physical health | 2.53 (1.11) | 2.60 (0.86) | *t*=1.60 | *p*=.11 |
| **Mental Health** | | | | |
| Stress | 19.75 (6.38) | 19.22 (6.25) | *t*=0.53 | *p*=.60 |
| Depression | 10.18 (4.31) | 8.64 (4.30) | *t*=2.28 | *p*=.02 |
| Anxiety | 6.47 (3.43) | 5.82 (3.53) | *t*=1.21 | *p*=.23 |
| PTSD | 1.99 (0.94) | 1.57 (0.79) | *t*=2.90 | *p*=.00 |
| **Meditation** | | | | |
| Meditated with Calm pre-COVID-19[1] | *n*=161 (73.18%) | *n*=43 (86.00%) | $\chi 2$=3.62 | *p*=.06 |
| Meditates with Calm currently[1] | *n*=144 (65.45%) | *n*=29 (58.00%) | $\chi 2$=0.98 | *p*=.32 |
| Frequency/duration of meditation: Change during COVID-19 | 3.67 (1.56) | 3.56 (1.39) | *t*=0.43 | *p*=.67 |
| Strength of meditation habit: Pre-COVID-19 | 23.02 (4.65) | 21.14 (4.7) | *t*=2.36 | *p*=.02 |
| Strength of meditation habit: Current | 23.35 (6.19) | 23.66 (7.21) | *t*=-0.23 | *p*=.82 |
| Strength of meditation habit: Change during COVID-19 | -0.49 (3.25) | 1.11 (4.42) | *t*=-2.19 | *p*=.03 |

**Table 1:** COVID-19 perceptions, mental health, and meditation.

## 4. Discussion

This is the first paper to describe perceptions of COVID-19, mental health and meditation habits in a sample of pregnant women who subscribe to the meditation mobile app Calm as compared to nonpregnant women. Our data suggests that pregnant women have more worry about getting COVID-19 and take more precautionary measures to prevent infection than non-pregnant women. Our findings also suggest that pregnant women had less severe symptoms of depression and PTSD. Additionally, while pregnant women reported weaker pre-COVID-19 meditation habits (e.g., meditating at same time of day or same place, same types of meditation) they had larger increases in the strength of their meditation habits during the pandemic. It is well established that women may be more cautious about their health and more receptive to changing their health behaviors during pregnancy because of the impact their health and health behaviors may have on their unborn child [15]. Therefore, it is not surprising women took more precautionary measures and had larger increases in the strength of their meditation habit.

The increase in strength of meditation habits among pregnant women could be why they were equally as stressed as non-pregnant women from COVID-19 despite reporting greater worry about getting infected. Pregnant women's increase in strength of meditation habits may also have mitigated symptoms of depression and PTSD. Because these data are cross-sectional, future efficacy testing is warranted. Additionally, this study is limited in further evaluating subgroup analyses as we do not have other information related to women who reported being pregnant (e.g., gestation, due date, complications).

## Acknowledgments

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## Conflicts of Interest

Dr. Huberty has an ongoing partnership conducting research utilizing Calm (6+ years). This research aims to identify, if and how, using a mobile meditation app, such as Calm, may improve mental and physical health in a variety of populations (e.g., cancer, pregnancy). Additionally, she is interested in identifying appropriate strategies to increase adherence to using mobile apps to improve health. This work led to her consulting role as the Director of Science and Director of the Scientific Advisory Board (SAB) at Calm. In this role, Dr. Huberty incorporates her ongoing research related to leveraging industry platforms to deliver meditative and yogic practices to improve population health with advancing the evidence-base for the Calm app. Dr. Huberty conducts investigator-initiated research that utilizes the Calm app, but Calm does not financially support her research. Dr. Huberty is paid for her consultation on an as-needed basis; however, her role is to ensure the quality of Calm's science and she has no specific obligations to the company. Dr. Huberty receives no financial incentives (e.g., stocks) related to the growth or success of the company. All other authors declare no conflict of interests.

## References


1. Ali N A, Shahil Feroz A. Maternal mental health amidst the COVID-19 pandemic. In Asian Journal of Psychiatry 54 (2020): 102261.
2. Center for Disease Control and Prevention. Pregnancy, Breastfeeding, and Caring for Newborns (2020).
3. Davenport M H, Meyer S, Meah V L, et al. Moms Are Not OK: COVID-19 and Maternal Mental Health. Frontiers in Global Women's Health (2020).
4. Leight K L, Fitelson E M, Weston C A, et al. Childbirth and mental disorders. In International Review of Psychiatry 22 (2010): 453-471.
5. Corbett G A, Milne S J, Hehir M P, et al. Health anxiety and behavioural changes of pregnant women during the COVID-19 pandemic. In European Journal of Obstetrics and Gynecology and Reproductive Biology 249 (2020): 96-97.
6. Di Mascio D, Khalil A, Saccone G, et al. Outcome of coronavirus spectrum infections (SARS, MERS, COVID-19) during pregnancy: a systematic review and meta-analysis. American Journal of Obstetrics & Gynecology MFM 2 (2020): 100107.
7. Gál É, Ștefan S, Cristea I A. The efficacy of mindfulness meditation apps in enhancing users' well-being and mental health related outcomes: a meta-analysis of randomized controlled trials. In Journal of Affective Disorders 279 (2021): 131-142.
8. Green J, Huberty J, Puzia M, et al. Does persistent meditation and physical activity mediate the relationship between perceptions of COVID-19 and mental health? A cross sectional survey of mobile app users in the United States. BMC Public Health (In Review).
9. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. Journal of Health and Social Behavior 24 (1983): 385-396.
10. Cohen Sheldon. Perceived stress in a probability sample of the United States (1988).
11. Hosey M M, Leoutsakos J S, Li X, et al. Screening for posttraumatic stress disorder in ARDS survivors: validation of the Impact of Event Scale-6 (IES-6). Crit Care 23 (2019): 276.
12. Zigmond A S, Snaith R P. The hospital anxiety and depression scale. Acta Psychiatr Scand 67 (1983): 361-370.
13. Gardner B, Abraham C, Lally P, et al. Towards parsimony in habit measurement: Testing the convergent and predictive validity of an automaticity subscale of the Self-Report Habit

Index. International Journal of Behavioral Nutrition and Physical Activity (2012).

14. Ho D E, Imai K, King G, et al. Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference. Political Analysis 15 (2007): 199-236.
15. Olander E K, Smith D M, Darwin Z. Health behaviour and pregnancy: a time for change. In Journal of Reproductive and Infant Psychology 36 (2018): 1-3.