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REPORT

The impact of the COVID-19 pandemic on depression and stress levels in pregnant women: a national survey during the COVID-19 pandemic in Mexico

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ABSTRACT

Background: COVID-19 outbreak has been associated with a wide variety of psychiatric manifestations such as panic, anxiety, and depression. We aim to assess the impact of the COVID − 19 pandemic on the levels of stress and depression of pregnant women in Mexico.

Methods: A cross-sectional web survey was carried out in pregnant women in 10 states of the Mexican Republic during the COVID-19 pandemic among public and private hospitals. The perception of stress was assessed using the Perceived Stress Scale, while depressive symptoms were evaluated using the Edinburgh Postnatal Depression Scale.

Results: A total of 549 surveys were applied, of which 96.1% ($n = 503$) were included in the data analysis. The mean participant's age was 28.1 years old. The mean perceived stress scale score was 24. 33.2% ($n = 167$) of participants had a score equal to 27 points or more and were considered highly stressed. The mean depression score was 9. A total of 17.5% ($n = 88$) participants had more than 14 points on the Edinburgh's depression scale, and were considered depressed. Stress levels were higher at later gestational ages ($p = .008$).

Conclusions: COVID-19 pandemic has caused mental health issues in pregnant women reflected by high perceived stress levels and depression.

Introduction

The COVID-19 pandemic has caused physical and mental effects worldwide, causing severe impacts on the mental health of the infected people, healthcare professionals, and quarantined people [1]. This pandemic has generated stress throughout the population, increasing panic, public restrictions, mass quarantine, and overwhelming pressure on pregnant women [2–4]. Depression during pregnancy has also been associated with a lack of early prenatal care-seeking, unhealthy behaviors, preterm delivery, low birth weight, limitation of mother-child interactions during the early stages of neonatal development [5,6].

We hypothesize that during the COVID-19 pandemic, pregnant women suffer higher levels of depression and stress. Therefore, the objective of this study

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Table 1. Characteristics of the studied population.

Characteristic	N = 503
Maternal Age, mean (SD)	28.1 (6.25)
<18 yo, n (%)	22 (4.6)
19–34 yo, n (%)	393 (82.2)
>34 yo, n (%)	63 (13.8)
Gestational age at questionnaire, mean (SD)	27.9 (10.3)
First trimester pregnancies, n (%)	61 (14.3)
Second trimester pregnancies, n (%)	139 (32.6)
Third trimester pregnancies, n (%)	227 (53.2)
PSS scores, median (IQR)	24 (9)
PSS of 27 or more points, n (%)	167 (33.2)
EPDS scores, median (IQR)	9 (7)
EPDS of 14 points or more, n (%)	88 (17.5)

PSS: Perceived stress scale; EPDS: Edinburgh's postnatal Depression Scale; SD: Standard deviation; IQR: Interquartile range.

is to assess the levels of depression and stress in Mexican pregnant women during the COVID-19 pandemic.

Materials and methods

This web-based cross-sectional clinical self-reported questionnaire was carried out in consecutive pregnant women from ten states of Mexico between May 5th and June 12th, 2020. Inclusion criteria were pregnant women who attended prenatal care from public and private hospitals despite the gestational age or pregnancy characteristics, aiming for an open-population survey analysis. The survey was designed on SurveyMonkey online platform consisting of three sections: Maternal history, the Perceived Stress Scale (PSS scale) [7], and the Edinburgh's Postnatal Depression Scale (EPDS) [8].

The main outcomes were depression, which was defined as a depression score using the EPDS equal to or greater than 14. The second main outcome was high stress levels, defined by a score equal or greater than 27 on the PSS scale.

Categorical variables were described as number and percentages, and continuous variables as median and interquartile range (IQR). The relationship between the PSS scale and the depression score to maternal age and gestational was assessed using Pearson's correlation coefficient and graphed on a two-way plot. Data were analyzed using STATA for Mac, v.16.1 (College Station, Texas).

Results

Characteristics of the included population

A total of 549 surveys were applied, of which 96.1% (n = 503) were included in the data analysis due to incomplete questionnaire responses. The mean maternal age at survey was 28.1 (IQR: 6.25) years old. There
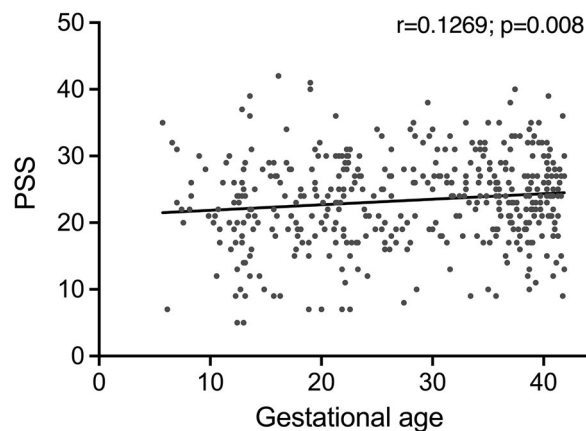
Figure 1. Correlation between gestational age at survey and the Perceived Stress Scale Scores.

were 25 women with missing values on the birthdate question leaving 478 for analysis on age. From these 478 participants, 4.6% (n = 22) were <18 years old, 82.2% n = (393) were between 19 and 34 years, and 13.8% (n = 63) were older than 34 years. The mean gestational age at questionnaire was 27.9 weeks' gestation. Table 1 shows the characteristics of the studies population as well as the results of the PSS and EPDS scores.

Results on the perceived stress scale

The results on the perceived stress scale showed that the overall score was 24 (IQR: 9) among 503 participants. From these, 33.2% (n = 167) had 27 points or more and were considered stressed.

Results on the Edinburgh's postnatal depression scale

Regarding the EPDS, the median score was 9 points (IQR: 7). 17.5% (n = 88) of the participants had 14 points or more, which is considered the threshold for depression.

Stress and depression according to maternal age and gestational age

Analysis of the median score for the perceived stress scale according to the trimester of gestation showed a significant increase of PSS scores among later trimesters (p = .001), which was reflected as a positive correlation between perceived stress and gestational age (r = 0.1269; p = .008; Figure 1). Complete analysis of the PSS and EPDS scores, including analysis according to trimester of gestation can be found in Supplemental Table 1–3 in the supplemental material.

Discussion

The main findings of this study are the 33.2% of stressed pregnant women during the COVID-19 pandemic and the 17.5% prevalence of depression during pregnancy which seems to be lower than in other developing countries like the study performed by Parra-Saavedra et al. in Colombia, where they found that 50.4% of the surveyed patients had anxiety and 25% depressive symptoms [9]. Interestingly, there was a significant increase in stress levels in the last trimesters of gestation compared to the first trimester, which was also reflected in a statistically significant correlation between the stress score and later gestational ages.

In recent studies, the percentage of pregnant women with depression and the anxiety scores were significantly higher, which arguments for an urgent need to provide psychosocial support to this population during the crisis [10]. There is also evidence of a worse mother-infant bonding at one month after birth [11] as well as higher adverse outcomes such as preeclampsia, preterm labor, low birth weight, and low Apgar scores [12].

According to Biaggi et al. [13], risk factors for anxiety and depression in women are being of younger ages, having low education achievements, poor working conditions, unemployment, low income, financial hardships, belonging to a minority ethnic group, and childhood maltreatment are risk factors for anxiety and depression. In the context of Latin America, it remains true that there are huge social gaps and disadvantages that could lead to a higher rates of risk factors that may be influencing the higher prevalence of stress and depression as shown in our results and mentioned by Parra-Saavedra.

The main limitation of this study is the cross-sectional design does not allow us to find a causal relationship between stress/depression and the COVID-19 pandemic. Nevertheless, this limitation is part of all survey designs, and cannot be tackled unless performing a longitudinal study. The main strengths of our study are the avoidance of open non-supervised recruitment of patients and the recruitment of consecutive participants in order to avoid any recall bias.

Conclusion

COVID-19 pandemic has caused mental health issues in pregnant women reflected by high perceived stress and depression levels, specifically stress, which is higher at higher gestational ages.

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