**Pregnant women's mental health during the COVID-19 pandemic according to the trimester of pregnancy**

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**Conflict of interest**

The authors have no conflict of interest to disclose.

**Abstract**

Aim: This study aimed to analyze the psychological impact of the COVID-19 pandemic on pregnant women according to the pregnancy trimester, comparing their psychopathological symptomatology, pregnancy-specific stress, resilience and perceived stress to those of women pregnant before the pandemic. Methods: A total of 797 pregnant women participated in the study, one group of 393 women pregnant before the pandemic and the other of 404 women pregnant during the pandemic. Student-t test was used to analyze continuous data and the Chi-square test was used for categorical data. Results: Psychopathological symptomatology was significantly higher in six subscales of the SCL-90-R in pregnant women during COVID-19: somatization, interpersonal sensitivity, depression, anxiety, phobic anxiety, obsessions-compulsions, mainly on the first two trimesters. There is also a higher level of pregnancy-specific stress in pregnant women during the pandemic on the first two trimesters, most likely due to the hypervigilance and fears related to the COVID-19 disease. Nevertheless, perceived stress, usually elevated during pregnancy, was lower in women pregnant during the pandemic in comparison to those pregnant before, as a positive consequence of being on lockdown and diminishing the exposure to daily stressful situations. Conclusions: Knowing the struggles these women go through during each trimester of pregnancy can be the key to a better health professional-patient relationship, consequently having a positive impact on their mental and physical health.

**Keywords:** COVID-19, Pregnancy trimesters, Psychopathology, Stress, Prenatal period

**Introduction**

Pregnancy is a vital transitional stage in women’s life during which they are exposed to substantial changes, both of a physical and psychological nature. These alterations require major adaptations, making women particularly vulnerable at a psychopathological level (Cetin et al., 2017; Romero-Gonzalez et al., 2020). In addition, pregnancy is characterized by the combination of different variables such as unpredictability, novelty and uncertainty, factors that contribute to increased levels of stress (Cetin et al., 2017). This stress includes a pregnancy-specific type of stress, which encompasses concerns about physical symptoms, fetal health, childbirth, interpersonal relationships, and motherhood (Lobel et al., 2008).

High levels of psychological stress have negative effects on pregnant women’s health status, increasing their anxiety levels and the likelihood of preterm and instrumental births as well as postpartum depression (Boekhorst et al., 2021; Mariño et al., 2021; Menclova & Stillman, 2020; Romero-Gonzalez et al., 2019). But it also entails adverse consequences for the physical, cognitive and psychological development of their offspring, such as changes in the fetus’ intrauterine growth and lower birth weight, increasing the probability of developing psychopathologies throughout life (Boekhorst et al., 2021).

Pregnant women have also been observed to be generally more vulnerable to various psychopathologies such as obsessive-compulsive disorder, with approximately 1.5-2 times higher likelihood than the general population (Russell et al., 2013). They are also more subject to depression and anxiety symptomatology, with a prevalence of 16% for depression and between 21% and 25% for anxiety (Field, 2017; Okagbue et al., 2019). These data highlight the key role of prevention directed towards pregnant women, not only of chronic diseases but also of psychological disorders (Koletzko et al., 2019). Moreover, expecting mothers present higher levels of perceived stress and hair cortisol compared to non-pregnant women (Romero-Gonzalez et al., 2020). Prenatal anxiety has also been found to lead to a greater likelihood of c-section, obstetric problems, low birth weight and lower baby self-regulation (Field, 2017; Karlen et al., 2015; Menclova & Stillman, 2020; Mulder et al., 2002; Lautarescu et al., 2020) . Also notable is how the adverse effects deriving from the mother’s psychological state during pregnancy can persist throughout the offspring’s life, finding a higher risk of developing medical conditions as congenital heart diseases, obesity or asthma, even a higher risk of developing autism (Al-Hussainy & Mohammed, 2021; Caparros-Gonzalez et al., 2021; Field, 2017; Gu & Guan, 2021; Lahti et al., 2017; Lamichhane et al., 2020). With regard to hair cortisol, its measurement provides a retrospective measure of chronic stress (D’Anna-Hernandez et al., 2011; Stalder & Kirschbaum, 2012), and high levels have been linked to health problems in women, as well as problems in child development (Caparros-Gonzalez et al., 2019; Caparros-Gonzalez et al., 2021; Galbally et al., 2019; Hoffman et al., 2016; Keskitalo et al., 2021; Khoury et al., 2020; Romero-Gonzalez et al., 2018).

More importantly, some studies have focused on identifying the relevance of ‘sensitive periods’ during pregnancy that could influence maternal mental and physical health outcomes and the offspring’s vulnerability to being affected by it (Davis & Narayan, 2020). One study identified a relationship between pregnancy-related anxiety during at least two trimesters and the risk of having male children with ADHD (Shao et al., 2020). Another study found a relationship between maternal depressive symptomatology during pregnancy and the presence of psychiatric problems in young children, but it was not related to a specific trimester (Lahti et al., 2017). In addition to the impact on the offspring, women’s physical and psychological quality of life can also be affected by pregnancy. A systematic review showed most studies relate a decrease in the physical quality of life during the third trimester and an increase in the mental health-related quality of life across the three trimesters, nevertheless, these authors find that experiencing stress leads to a decrease in quality of life, highlighting the need to manage and the importance of assessing stressful situations during pregnancy. Besides, similar to the studies mentioned before, the results in this matter are inconclusive (Lagadec et al., 2018).

In this sense, studies differentiating maternal mental health across trimesters are strongly required. Pregnant women have been seen to display different types of symptoms and worries according to the trimester of pregnancy they are in, typically prenatal maternal worries are displayed in a u-shaped curve across trimesters, with its lowest point during the second trimester, compared to the first and third one (Gourounti et al., 2012; Soto Balbuena et al., 2018). Specifically, anxiety has been one of the most prevalent symptoms throughout the whole pregnancy, but has its peak during the first and third ones as described before (Rezaee & Framarzi, 2014). Each trimester can be characterized by different types of worries, during the first trimester physical discomfort and worries of child loss are most present, the second trimester usually has a positive amplification and women have a tendency to have less worries and finally the third trimester worries are mostly centered on the delivery outcomes and preparedness, even though giving birth is a worry that can be present throughout the whole pregnancy (Gourounti et al., 2012; Mirzaee et al., 2023). Nevertheless, during the pandemic, this tendency could be affected due to the major worries the health and social changes due to COVID-19 might generate, in this context a prenatal pandemic-related stress appears to be higher in women during their second and third trimester, compared to the first one (Preis et al., 2020). Also, factors such as being overexposed to COVID-19 news or information heightened women’s anxiety levels, a variable that without the pandemic would not be relevant for a pregnant woman (Esteban-Gonzalo et al., 2021).

Mental disorders can also be heightened by highly stressful situations, in this sense, the COVID-19 pandemic has increased pregnant women’s levels of psychological stress, anxiety and depression (Boekhorst et al., 2021; Puertas-Gonzalez et al., 2021; Romero-Gonzalez et al., 2020). In addition, it appears that anxiety and stress levels are higher in the first trimester of pregnancy than in the subsequent trimesters (Boekhorst et al., 2021). In case of depression, around 16% had the onset during the third trimester, and during the entire pregnancy one-third occurred in the first trimester, being the probability of starting pregnancy with depressive symptoms is higher than their development during pregnancy (Wilcox et al., 2021). Pregnant women’s psychopathological symptomatology seems to be related to facing new circumstances and concerns during the health crisis, such as fear of contagion; uncertainty about companionship during childbirth; reduction of in-person medical examinations; lack of knowledge regarding the evolution of the COVID-19 infection in pregnant women; the possibility of vertical transmission and the possible consequences for the fetus (Boekhorst et al., 2021; Puertas-Gonzalez et al., 2021).

A study comparing pregnant women’s mental health before and during the COVID-19 pandemic, identified a higher incidence of depressive symptoms in pregnant women during the pandemic, as well as lower levels of stress, in comparison to pregnant women before the pandemic (Mei et al., 2021). However, other studies that have compared the psychological state before and during the pandemic have found higher levels of depression, perceived stress, anxiety, comorbid depression and anxiety, and phobic anxiety in pregnant women during the pandemic (Mateus et al., 2022; Puertas-Gonzalez et al., 2021). Nevertheless, pregnancy-specific stress in addition to daily stress must be addressed, as well as other relevant psychopathological symptomatology, such as obsessions and compulsions.

Nevertheless, regarding the impact of prenatal mental health, positive experiences during pregnancy can also ameliorate the negative effect of stressful situations and distress during this period. In these cases, the level of resilience in pregnant women plays an important role, and can even diminish the negative impact on the offspring (Davis & Narayan, 2020). In this line, it has been found that pregnant women with lower scores in resilience appear to have increased psychopathological symptomatology, stress, and hair cortisol levels, as a measure of chronic stress, in comparison to those who had higher scores in resilience (García-León et al., 2019).

Despite the evidence described above, no studies have hitherto explored psychological symptomatology, perceived stress, and pregnancy-specific stress in one study, differentiating between trimesters of pregnancy during the COVID-19 health crisis. An aspect that could be key to identifying the possible differences of trimesters on both women and how these differences could have an impact on their offspring’s health. Moreover, the present study is of special interest because of the scarce evidence about psychological symptomatology, perceived stress, and pregnancy-specific stress in pregnant women during the pandemic and the role of potentially protective variables, such as resilience.

Therefore, the objective of the present study was to determine the psychological impact of the COVID-19 pandemic on pregnant women according to the pregnancy trimester, comparing their psychopathological symptomatology, pregnancy-specific stress, perceived stress and resilience to those of women pregnant before the pandemic.

# **Materials and methods**

**Participants**

This cross-sectional study was carried out with a total of 797 pregnant women. The sample was composed of two groups: 393 (M=33.01 years old; SD=4.561) belonged to the group of women pregnant before the pandemic, and 404 (M=33.56 years old; SD=4.327) belonged to the group of pregnant women during the pandemic.

The inclusion criteria were to be of legal age (>18 years), to be pregnant, and have a good understanding of the Spanish language. In addition, women pregnant during the pandemic had to have access to the Internet. The exclusion criterion was to present a diagnosed psychopathological disorder that required treatment or medication.

Once they had read the study’s fact sheet, all participants signed the informed consent following the guidelines of the Declaration of Helsinki (WMA, 2008) and the Directive on Good Clinical Practice (Directive 2005/28/EC) of the European Union. The study was approved by The Human Research Ethics Committee of the University of Granada (1518/CEIH/2020).

**Instruments**

The sociodemographic variables (age, country of origin, educational level, etc.) and obstetric variables (first-time pregnancy, mode of conception, etc.) were collected through a questionnaire with Likert-type responses as well as dichotomous and open answers.

The outcome variables obtained through the psychological assessment were:

* *The Symptom Checklist-90-Revised. (SCL-90-R,* Caparrós-Caparrós et al., 2007; Derogatis, 1994):is a self-report that describes 9 dimensions of psychopathology: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. It is scored through a 5-point Likert Scale, where 0 answers to “never” and 4 to “extremely”. Following the author’s instructions, the scores are later converted into percentiles (0-100). The Cronbach's alpha reliability coefficients of the Spanish version ranged between 0.67  and α  0.94.
* *Prenatal Distress Questionnaire (PDQ,* Caparros-Gonzalez et al., 2019; Yali & Lobel, 1999): assesses specific pregnancy concerns related to physical symptoms, interpersonal relationships, motherhood, medical issues and labour. It has 12 items and is scored on a 5-point Likert scale from 0-4, where 0=not at all and 4=very much. The Spanish version has reflected adequate reliability with a Cronbach α of 0.71.
* *Perceived Stress Scale (PSS,* Cohen et al., 1983; Remor, 2006): This 14-item self-report instrument provides information about the perceived stress during the previous month. This scale can be scored from 0-56, it is scored on a 5-point Likert scale (0-4), and a higher score reflects a higher level of stress. The Spanish version shows internal consistency, it has a Cronbach α of 0.81.
* *Connor-Davidson Resilience Scale (CD-RISC-10,* Connor & Davidson, 2003; Notario-Pacheco et al., 2014): the abbreviated version of 10 items evaluates the subject’s capacity to endure changes, personal issues, sickness, pressure and fails. This is a single dimension scale that ranges from 0-40, and responses are given on a 0-4 Likert-type scale, where 0=almost never and 4=almost always. Its reliability in the Spanish version reflects a Cronbach α of 0.88.

**Procedure**

Pregnant women before the pandemic were gathered and assessed as part of the research protocol GESTASTRESS between February 2019 and August 2019. During their antenatal appointment, they were informed about the study, which consisted in assessing the psychological state of women during pregnancy to identify how cortisol, stress and other psychological variables could influence women’s health during pregnancy, labor and postpartum. If interested in participating they would sign an informed consent and fill out the assessment questionnaires. Their medical, obstetric, and sociodemographic information was obtained through the *Heath Document of the Pregnant Women.*

Women pregnant during the pandemic were contacted through their health professionals (midwives or gynecologists). They were informed that the aim of this study was to assess the psychological impact of the COVID-19 pandemic on pregnant women. Due to the social contact restrictions, a Google Forms Survey was designed to carry out the psychological assessment and the collection of sociodemographic, obstetric, and medical information. The midwife or gynecologist, once the woman agreed to participate, collected her personal data and passed them on to the research group. At this point, the researcher scheduled a date for the woman to complete the questionnaires, while the researcher maintained a phone call or video call with the participant in case she had any questions or the platform encountered an error, being present online throughout the evaluation to resolve any questions if needed. Additionally, participants were included by the snowball sampling method, since the pregnant women were requested to spread the information about the study to other potential participants. Similarly, those who agreed to participate provided their information to schedule the phone appointment. These participants were assessed between April 2020 and October 2020.

At this time, Spain was in the midst of its first wave of the pandemic, with a high number of daily cases and deaths. A strict national lockdown was implemented, restricting the movement of the population and closing most non-essential economic activities. As the pandemic progressed, between June and July 2020, a plan for a gradual regional de-escalation was established, allowing outdoor exercise and the resumption of some economic activities. The mandatory use of masks in public places where social distancing was not possible was also introduced. Starting in September, there was a resurgence, and local restrictions were implemented, including limitations on social gatherings and the adoption of partial confinement measures and additional restrictions.

**Data analysis**

To check whether both groups were equal in terms of the main sociodemographic and obstetric variables, Student's *t*-test was conducted for the continuous variables and the Chi-square test (χ²) for categorical variables. Before analyzing the psychological variables, the normality of the variables was confirmed using the Kolmogotov-Smirnov test and the homoscedasticity of the variables was verified using Levene's test.

Subsequently, various Student *t*-tests were performed to determine whether there were any differences between women pregnant during the pandemic and women pregnant before the COVID-19 pandemic regarding the psychological variables (psychopathological symptoms, perceived stress, pregnancy-specific stress, and resilience). To check if there was any trimester in which pregnant women were particularly psychologically vulnerable due to the pandemic, the two groups were compared during each pregnancy trimester.

In addition, the effect size of this difference between groups was calculated using Cohen's d following the established criteria: a value greater than 0.20 implies a small effect size; a value greater than 0.50 corresponds to a medium effect size, and a value greater than 0.80 indicates a large effect size.

The data were analyzed using SPSS version 26.0 for Macintosh (SPSS, Armonk, New York).

# **Results**

*Sample description*

The study involved a total of 797 pregnant women who were divided into two groups: the group of women pregnant before the pandemic (n=393) and those pregnant during the pandemic (n=404). In the first group,72 women were in their first trimester of pregnancy, 182 in their second, and 150 in their third trimester. In the second group, 69 women were in their first trimester of pregnancy, 177 in their second and 147 in their third.

Although the groups were equal regarding most of the sociodemographic variables, significant differences were found in the variable "first pregnancy" (*χ*²**=**4.599; *p*=.019). With more women undergoing their first pregnancy in the group who were pregnant during the pandemic (Table 1).

[Insert Table 1]

*Differences in psychopathological symptoms between groups concerning their trimester of pregnancy*

Regarding psychological variables, significant differences were obtained on the Student's t-test between pregnant women during the COVID-19 pandemic and pregnant women before the pandemic in the following dimensions:

In the first trimester, pregnant women during the pandemic had significantly higher scores on somatization (t=2.286; p=.024; d=0.39), interpersonal sensitivity (t=2.187; p=.030; d=0.37) and depression (t=4.283; p=.000; d=0.72). Pregnant women before the pandemic obtained significantly higher levels of psychoticism (t=-1.336; p=.0184; d=-0.23) and paranoid ideation (t=-4176; p=.000; d=-0.70).

Concerning the second trimester, pregnant women during the pandemic scored significantly higher on somatization (t=2.121; p=.035; d=0.22), interpersonal sensitivity (t=3.502, p=.001; d=0.37), obsessions and compulsions (t=2.307; p=.022; d=0.24), depression (t=5.235; p=.000; d=0.55) and anxiety (t=3.271; p=.001; d=0.35). In contrast, pregnant women before the pandemic scored significantly higher on paranoid ideation (t=-2.963; p=.003; d=-0.31).

In the third trimester, pregnant women during the pandemic scored significantly higher on depression (t=3.766; p=.000, d=.44) and phobic anxiety (t=2.445; p=.015, d=.28), while pregnant women before the pandemic had a significantly higher score in paranoid ideation (t=-2.105; p=.036; d=-0.24). The results are shown in Table 2.

*Pregnancy-specific stress according to the trimester of pregnancy*

The results of the scales assessing stress levels revealed significant differences between the two groups. In the first trimester, a higher score in the PDQ was observed in pregnant women during the pandemic (t=3.774; p=.000; d=0.64) with a medium effect size.

Also, in the second trimester significantly higher PDQ scores were seen in pregnant women during the pandemic (t=4.736; p=.000; d=0.5) with a medium effect size, while pre-pandemic pregnant women displayed higher scores in PSS (t=-3.70; p=.000; d=-0.39).

*Perceived stress according to the trimester of pregnancy*

Concerning the third trimester, the PSS score also indicated higher levels in the pre-pandemic group (t=-3.137; p=.002; d=-0.36). The differences can be observed in Figure 1.

[Insert Figure 1]

*Resilience according to the trimester of pregnancy*

No statistically significant differences between the two groups regarding resilience variables were found neither the first trimester (t=-.408; p=.684; d=0.07); the second trimester (t=-.358; p=.721; d=0.04) nor the third trimester (t=-.529; p=.597; d=0.06).

All scores for each psychological assessment can be found in Table 2.

[Insert Table 2]

# **Discussion and Conclusions**

The aim of this cross-sectional study was to analyze whether the COVID-19 pandemic led to any differential symptomatology in psychopathology, perceived stress, pregnancy-specific stress, and resilience between pregnant women before the pandemic and pregnant women during the COVID-19 pandemic according to the trimester of pregnancy. Our results indicate that pregnant women during the COVID-19 pandemic display a higher psychopathological profile during the first and second trimester of pregnancy, and those in their third trimester display a lower psychopathological symptomatology compared to pre-pandemic pregnant women. Pregnancy-specific stress displays a similar trend. Opposite results were found for perceived stress. In this way, higher stress scores were observed in the group of women who were pregnant before the pandemic, especially in the second and third trimesters. No differences in resilience were found between the two groups.

Regarding the psychopathological symptomatology of women pregnant during the pandemic, higher somatization scores found during the first and second trimesters could be related to being dramatically focused on any physical symptoms that may be related to the COVID-19 disease, and that may affect the fetus’ health through vertical transmission (Boekhorst et al., 2021; Mortazavi & Ghardashi, 2021; Wu et al., 2020). Moreover, during these trimesters—especially the first—the probability of miscarriage is greater than during the third trimester, so women tend to be more alert to any signs of a possible miscarriage, which adds to the impact of a lack of knowledge regarding the effect of the virus in these situations (Papapanou et al., 2021). The higher obsessive-compulsive symptomatology in this group adds to this state of hypervigilance and increases the use of extreme hygiene measures (Mortazavi & Ghardashi, 2021; Romero-Gonzalez et al., 2021). These symptoms are sometimes associated with negative obstetric outcomes such as preeclampsia, c-sections, instrumental deliveries, and preterm births (Nasiri et al., 2021).

Interpersonal sensitivity was also increased in this group, this symptom refers to thoughts of inferiority and negativity about interpersonal relationships, including expectations of rejection and criticisms by others (Jorgenson, 2017). This finding is in line with the results of Achterberg et al. (2021) and could be due to changes in social interactions and the reduction of social contacts brought about by the restrictive measures implemented.

As found in prior studies (Puertas-Gonzalez et al., 2021; Romero-Gonzalez et al., 2020; Wu et al., 2020), depressive symptoms were higher, with clinically relevant scores in the first trimester, possibly due to containment measures, as well as perceptions of lack of support and deeper feelings of loneliness (Mortazavi & Ghardashi, 2021; Romero-Gonzalez et al., 2021). On the other hand, the news and the fact of being constantly on the alert regarding the pandemic’s evolution may also have an impact on anxiety levels. Indeed, they lead to a more intensive watch of possible signs of COVID-19, which could be understood as the somatic counterpart to anxiety (Jorgenson, 2017). It could also be linked to a greater fear of suffering a miscarriage, which sometimes could lead to an increase in obsessive-compulsive symptoms, driven by the heightened need for self-care and environmental vigilance (Mortazavi & Ghardashi, 2021; Shafiq et al., 2023; Viswasam et al., 2021).

Nevertheless, higher levels of phobic anxiety found in the third trimester are incompatible with results previous to the pandemic that showed higher levels in the first trimester (Romero-Gonzalez et al., 2020). These may be due to the uncertainties around childbirth during a pandemic regarding being accompanied during childbirth; having adequate care; fear of contagion during the hospital stay and receiving less support during the postpartum period (Mortazavi & Ghardashi, 2021). Furthermore, most of the participants in this group were first-time mothers, which has been associated with an increase in psychopathological symptoms, especially at more advanced stages of pregnancy (Romero-Gonzalez et al., 2020). Considering this, it is important to mention that worse symptomatology in late pregnancy may lead to worse obstetric outcomes (Romero-Gonzalez et al., 2019).

Surprisingly, women pregnant before the pandemic presented the highest paranoid ideation and psychoticism levels. Paranoid ideation refers to increased anticipation of threat and distress in ambiguous situations and is often linked to psychoticism (Saarinen et al., 2018). During COVID-19, social gatherings were reduced and contacts were limited on many occasions, thus bringing down the number and intensity of ambiguous situations that give rise to the discomfort associated with this symptomatology (Saarinen et al., 2018). Lower paranoid symptomatology has also been found in the general population in studies conducted in Italy; therefore, the reduction of these symptoms may imply that social isolation has a positive effect on some people (Castellini et al., 2021).

Moreover, pregnant women experienced heightened levels of pregnancy-specific stress during the first two trimesters of pregnancy, yet reported lower levels of perceived stress. Consistent with prior research, these findings align with a pattern where pregnancy-specific stress is significantly correlated with stress induced by the pandemic, as well as with heightened anxiety due to concerns regarding the risk of infection. These studies argue that the differences observed in levels of specific pregnancy-related stress versus general stress may come from the inherent contextual stressor of being pregnant during a pandemic, manifesting in distinct concerns related to pregnancy, rather than an general perception of stress (Colli et al., 2022; Pope et al 2022). Additionally, increased watchfulness about other people and any potentially harmful stimuli such as COVID-19 is proper for women’s quest to ensure the survival of their offspring (Wu et al., 2020). Nevertheless, these findings show us that pregnant women can suffer increased psychopathological symptomatology without this being preceded by an increase in psychological stress, two concepts that have hitherto been widely associated.

In terms of resilience outcomes, no differences were found between both groups. One possible explanation for this fact can be found in the close relationship that exists between stress and resilience, as they have been found to be highly influenced by the same factors (Alves et al., 2021). Furthermore, a recent study has found that the patterns between resilience and stress during pregnancy are very similar before and during the pandemic (Puertas-Gonzalez et al., 2022). In this regard, it would be expected that pregnant women, already experiencing an inherently stressful pregnancy process (Geller, 2004), have low resilience, regardless of whether they are going through the pregnancy during the pandemic or prior to it.

This study presented some limitations. On the first hand, we excluded women with a mental illness since we considered this characteristic was not representative of our sample. Nevertheless, it could be useful to carry out a study with this sub-sample in the future. In addition to this, gathering participants during the pandemic through snowball sampling could have affected the homogeneity of the sample in variables like having a first-time pregnancy. Nevertheless, the sample size of the study gives more reliable results about the psychological state of women during each trimester of pregnancy. Finally, as this design is a cross-sectional study, it hinders drawing causal conclusions and obtaining a more comprehensive understanding of the variables under investigation and how they might evolve over time.

Finally, our results reflect pregnant women’s psychopathological symptoms and pregnancy-specific stress in the first and second trimesters during the COVID-19 were greatly altered compared to that of women who were pregnant before the pandemic, most likely due to the hypervigilance and fears related to the disease. This increases the likelihood of developing psychopathological disorders, as well as having aggravated obstetric consequences such as instrumental deliveries, low birth weight, or premature births. Nevertheless, perceived stress, usually elevated during pregnancy, was lower in women pregnant during the pandemic in comparison to those pregnant before, as a positive consequence of being on lockdown and diminishing the exposure to daily stressful situations. The obtained data underline the importance of psychological interventions for this population group.

All this information is relevant both to mental health professionals and general health professionals. There should be specific psychological assistance and guidance for these women and the professionals that treat them to receive better feedback from them. Knowing the struggles these women go through during each trimester of pregnancy can be the key to a better health professional-patient relationship, consequently having a positive impact on their mental and physical health. Furthermore, differentiating stress levels can enable the implementation of measures in the political sphere to alleviate its effects. It is important to highlight the cost associated with the consequences of high prenatal stress, such as premature birth or the need for surgical intervention, among others. As proposed by Fulchet et al. (2023), it is important for there to be specific social action policies for this population, such as improving screening and monitoring measures, or the development of e-health applications (Barber & Masters-Awatere, 2022).

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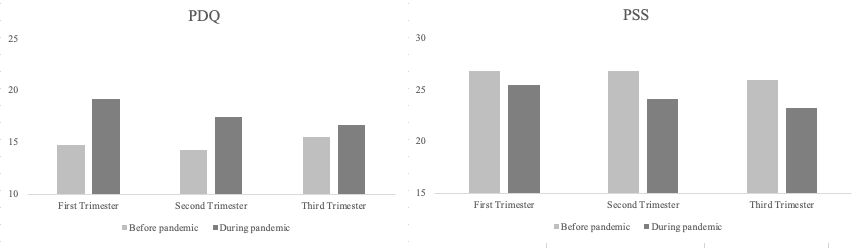
**Table 1.**   
*Sample description*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Before pandemic  (n=392)  M(SD)/n (%) | During pandemic  (n=404)  M(SD)/n (%) | *t*/*χ*² | *p* |
| *Sociodemographic variables* | |  | | | |
| Age |  | 33,01(4,561) | 33,56(4,327) | 1.744 | .081 |
| Educational level | Primary school | 6(1,5%) | 3(0,7%) | 5.671 | .129 |
|  | Secondary school | 114(29,1%) | 95(23,5%) |  |  |
|  | University | 271(69,1%) | 306(75,7%) |  |  |
| Marital status | Married/cohabiting | 383(97,7%) | 390(96,5%) | .970 | .220 |
|  | Single | 9(2,3%) | 14(3,5%) |  |  |
| Country of origin | Spain | 334(85,0%) | 352(87,01%) | 2.550 | .279 |
|  | Immigrant | 57(14,5%) | 52(12,9%) |  |  |
| *Obstetric variables* | |  |  |  |  |
| Mode of conception | Spontaneous | 346(88,3) | 362(89,6) | 1.666 | .435 |
| Assisted reproduction | 46(11,7) | 42(10,4) |  |  |
| Children | 0 | 245(60,6) | 222(0,584) | 5.785 | .060 |
| 1 | 140(34,7) | 135(34,4) |  |  |
| >2 | 19(4,7) | 35(8,9) |  |  |
| First-time pregnancy | Yes | 191(48,6%) | 227(56,2%) | 4.599 | **.019\*** |
| No | 202(51,4%) | 177(43,8%) |  |  |
| Pregnancy trimester | First | 69(17,6%) | 72(17,8%) | .012 | .994 |
| Second | 177(45%) | 182(45%) |  |  |
| Third | 147(37,4) | 150(37,1%) |  |  |

*Note.* \*p<.05

**Figure 1**

*Mean scores in perceived stress and prenatal concerns according to the trimester of pregnancy*



*Note.* PDQ=Prenatal Distress Questionnaire; PSS=Perceived Stress Scale

**Table 2.**   
*Comparison between psychological variables according to the trimester of pregnancy*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Questionnaires | Before pandemic  (n=69) M(SD) | During pandemic  (n=72) M(SD) | *t* | *p* | Cohen’s *d* |
| First Trimester | Psychopathological symptoms  (SCL-90-R) | SOM | 66.25(23.47) | 75.06(22.24) | 2.286 | **.024\*** | 0.39 |
| OBS | 74.29(24.57) | 76.39(26.39) | .488 | .626 | 0.08 |
| INTP | 52.09(30.76) | 63.47(31.03) | 2.187 | **.030\*** | 0.37 |
| DEP | 53.07(27.83) | 72.75(26.68) | 4.283 | **.000\*** | 0.72 |
| ANS | 68.38(25.39) | 73.86(22.85) | 1.350 | .179 | 0.23 |
| HOST | 58.91(31.65) | 57.94(33.39) | -.177 | .860 | 0.03 |
| FOB | 75.52(25.22) | 66.11(32.89) | -.901 | .059 | 0.32 |
| PSI | 68.87(30.19) | 61.18(37.56) | -1.336 | **.018\*** | 0.23 |
| PAR | 66.91(27.96) | 43.31(38.54) | -4.176 | **.001\*** | 0.7 |
| Psychological stress and Resilience | PSS | 26.77(5.08) | 25.46(8.39) | -1.100 | .273 | 0.19 |
| CD-RISC | 26.80(6.82) | 26.32(7.07) | -.408 | .684 | 0.07 |
| PDQ | 14.70(5.98) | 19.15(7.83) | 3.774 | **.001\*** | 0.64 |
|  |  | **Questionnaires** | **Before pandemic**  **(n=177) M(SD)** | **During pandemic**  **(n=182) M(SD)** | ***t*** | ***P*** | **Cohen’s *d*** |
| Second Trimester | Psychopathological symptoms  (SCL-90-R) | SOM | 60.37(24.89) | 65.85(23.98) | 2.121 | **.035\*** | 0.22 |
| OBS | 67.20(26.79) | 73.65(26.22) | 2.307 | **.022\*** | 0.24 |
| INTP | 51.61(30.11) | 62.71(29.94) | 3.502 | **.001\*** | 0.37 |
| DEP | 49.37(28.99) | 65.34(28.78) | 5.235 | **.001\*** | 0.55 |
| ANS | 59.31(30.48) | 69.26(27.01) | 3.271 | **.001\*** | 0.35 |
| HOST | 48.71(31.28) | 55.02(33.77) | 1.836 | .067 | 0.19 |
| FOB | 55.80(36.48) | 54.63(36.88) | -.301 | .764 | 0.03 |
| PSI | 60.02(32.37) | 63.48(33.77) | .991 | .322 | 0.11 |
| PAR | 54.87(33.50) | 43.88(36.70) | -2.963 | **.003\*** | 0.31 |
| Psychological stress and Resilience | PSS | 26.77(3.35) | 24.13(8.99) | -3.702 | **.001\*** | 0.39 |
| CD-RISC | 27.78(5.86) | 27.55(6.27) | -.358 | .721 | 0.04 |
| PDQ | 14.28(5.78) | 17.43(6.77) | 4.736 | **.001\*** | 0.5 |
|  |  | **Questionnaires** | **Before pandemic**  **(n=147) M(SD)** | **During pandemic**  **(n=150) M(SD)** | ***t*** | ***P*** | **Cohen’s *d*** |
| Third Trimester | Psychopathological symptoms  (SCL-90-R) | SOM | 61.99(25.46) | 66.69(26.14) | 1.575 | .116 | 0.18 |
| OBS | 67.95(27.87) | 72.49(24.44) | 1.496 | .136 | 0.17 |
| INTP | 55.54(31.41) | 58.69(31.12) | .866 | .387 | 0.1 |
| DEP | 53.81(27.78) | 66.28(29.28) | 3.766 | **.001\*** | 0.44 |
| ANS | 65.50(27.93) | 67.85(27.75) | .725 | .469 | 0.08 |
| HOST | 48.89(31.55) | 53.93(32.89) | 1.348 | .179 | 0.16 |
| FOB | 54.01(36.57) | 65.77(32.07) | 2.445 | **.015\*** | 0.28 |
| PSI | 58.55(35.84) | 56.93(34.99) | -.394 | .694 | 0.05 |
| PAR | 51.54(37.66) | 42.42(37.04) | -2.105 | **.036\*** | 0.24 |
| Psychological stress and Resilience | PSS | 25.96(5.03) | 23.21(9.42) | -3.137 | **.002\*** | 0.36 |
| CD-RISC | 28.77(5.55) | 28.39(6.69) | -.529 | .597 | 0.06 |
| PDQ | 15.15(6.52) | 16.67(7.18) | 1.904 | .058 | 0.22 |

*Note* \*p<.05; SOM=somatization; OBS=obsession-compulsion; INTP=interpersonal sensitivity; DEP=depression; ANS=anxiety; HOST=hostility; FOB=phobic anxiety; PSI=psychoticism; PAR=paranoid ideation; PSS=Perceived Stress Scale; CD-RISC=Connor-Davidson Resilience Scale; PDQ=Prenatal Distress Questionnaire