Case Study

Perception of care and emotional impact of perinatal women during COVID-19: A multicenter study

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ABSTRACT

To evaluate in women in the perinatal period during COVID-19 the perception of the care received by the healthcare system, the prevalence and levels of anxiety and depression symptoms, the presence of post-traumatic stress, and its association with sociodemographic and maternity-related variables. A final sample of 559 women responded to an online cross-sectional survey, which included the Coronavirus Perinatal Experiences-Impact survey, the State-Trait Anxiety Inventory, the Beck Depression Inventory-II, and the Posttraumatic-Stress Symptoms-PCL5.

Most of the participants reported a negative impact of the pandemic on their general mental health, the need for social support, and high levels of state anxiety. The main concerns identified by women who experienced the perinatal period during COVID-19, and most associated with anxiety and depressive symptoms were: concern about future childcare, receiving support from health professionals, complications during pregnancy, and use of virtual support groups. It is crucial to prioritize psychological support for women in perinatal periods by creating a specific protocol to provide the necessary support and improve maternal care, especially during emergency crises or in groups with less access to social/health support.

Keywords: Maternity, Pregnancy, Mental health, Social support, COVID-19

Introduction

One of the pivotal stages in a woman's life is the experience of motherhood. This period can be a positive event for many women, but it can also render them vulnerable [1]. It is estimated that up to 20% of women may experience a mental health problem from conception to one year after childbirth, which can vary from mild depression and anxiety to mania and psychosis [2].

During pregnancy, women undergo physical and psychological changes, which can make them more vulnerable to mental health issues such as higher levels of anxiety and depression symptoms [3, 4]. Moreover, stress and anxiety during pregnancy have been linked to adverse obstetric outcomes, such as maternal disorders like gestational diabetes, as well as preterm delivery, low birth weight, and even fetal death [5], and may contribute to adverse effects on pregnancy outcome and infant development [6]. The postpartum period and the first year of parenting can also be vulnerable times for mental disorders. It is estimated that one in five women develop a mental disorder during these critical periods [6, 7].

COVID-19 was declared a pandemic by the World Health Organization (WHO) in March 2020 and was considered one of

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the major global health crises of the 21st century. It affected the economy, healthcare systems, and the quality of life for various population groups [8, 9]. Moreover, the pandemic had a significant psychological impact on pregnant women and mothers with children in their first year of life, who experienced an increase in anxious and depressive symptoms due to fear of contagion and concern for the health of their babies [10].

During the COVID-19 pandemic, many perinatal and neonatal healthcare practices were modified to reduce the risk of COVID-19 transmission, including the cancellation of usual courses provided to pregnant women and mothers, adjustments to appointments, restrictions on partner presence during delivery and follow-ups, and face-to-face consultations replaced by teleconsultations [11]. At the same time, confinement and social distancing measures were particularly challenging for these women [12].

The evidence suggests that mental disorders and, in general, emotional distress in pregnant women or mothers of infants younger than 12 months have increased since the onset of COVID-19. Regardless of sociodemographic characteristics, women who gave birth during the COVID-19 pandemic experienced a more significant acute stress response, and rates of depression and anxiety were two times higher compared to studies conducted prior to the pandemic [13, 14]. The current project focuses on studying women during the perinatal and neonatal periods in the Spanish regions of Cantabria, Catalonia, and Asturias during the COVID-19 pandemic. The aims are a) to evaluate the emotional impact of the pandemic and the subjective perception of the care received by the healthcare system, b) to evaluate anxiety levels, depressive symptoms, and posttraumatic stress, and c) to analyze the association between these psychosocial factors and maternity-related variables.

Materials and Methods

This is a multicentric, cross-sectional, descriptive, and observational study. It focuses on the female population of the Spanish regions of Cantabria, Catalonia, and Asturias that lived in the perinatal and neonatal periods during the COVID-19 pandemic. Data was collected from March to September 2022. This period was chosen to obtain data from pregnant women and mothers in the first year of parenting. In 2022 lockdown was over but some restrictive measures remained in the perinatal care setting (i.e., masks during deliveries, cancelled face-to-face groups).

Participants

A total of 1,130 women participated, of whom 559 were included. The inclusion criteria were a) women over 18, b) residing in Catalonia, Cantabria, or Asturias, c) pregnant or mother of a child aged one year or less, d) who lived the period of gestation, puerperium and/or first year of parenting during the COVID-19 pandemic (March 2020 to September 2022), e) speaking Catalan or Spanish. The exclusion criteria were a) psychological or psychiatric diagnosis or treatment, and c) difficulties in completing the survey **(Figure 1)**.

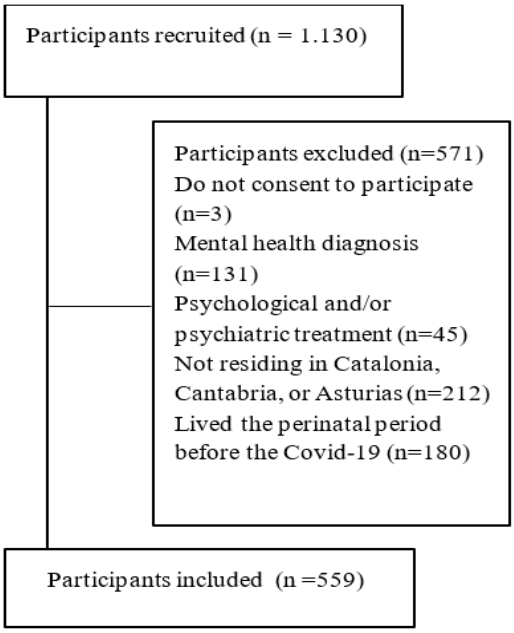

Figure 1. Consort flow diagram of the participants' recruitment process

Measures and variables

Data were gathered using anonymous surveys distributed through Google and Microsoft Forms. The surveys comprised informed consent, sociodemographic information, and self-administered questionnaires. Socio-demographic data and perinatal and neonatal experiences related to the COVID-19 pandemic were assessed using the Spanish version of the Coronavirus Perinatal Experiences-Impact Survey (COPE-IS) [15]. The sociodemographic data included: age, number of weeks of pregnancy, age of the baby/babies in months, as well as whether the mother and/or children tested positive for COVID-19. The perinatal and neonatal experiences were collected in different sections, including perinatal experiences related to the outbreak, financial considerations, current and expected future, and outbreak emotions and feelings. Anxiety levels were assessed using the Spanish validation of the State-Trait Anxiety Inventory (STAI) [16]. It is a self-administered questionnaire that evaluates both state anxiety (SA) and trait anxiety (TA). The inventory consists of a total of 40 items, with 20 items each for SA and TA. Each item is scored on a Likert scale ranging from 0 to 3 points. The total score for each factor ranges from 0 to 60 points. Three categories were established for each type of anxiety (low, medium, and high) according to the established scales for the Spanish population [16]. The instrument had good reliability with Cronbach's alpha values of 0.94 for SA and 0.92 for TA. Depressive symptoms were measured using the Spanish validation of the Beck Depression Inventory-II (BDI-II). It consists of 21 items, and respondents are asked to choose one of four options that describe their state over the last two weeks, with options ranked from least (0) to most severe (3) on a Likert scale. The final score ranged from 0 to 63 and was categorized as

minimal, mild, moderate, or severe. Posttraumatic stress was evaluated using the Posttraumatic Stress Symptoms (PTSD)-Checklist by DSM-5 (PCL5) questionnaire [17] which consists of 20 items assessing the DSM-5 symptoms corresponding to the criteria of posttraumatic stress. It has a Likert scale ranging from 0 to 4 points for each item. The total score ranges from 0 to 80 points.

Procedure

The project was conducted according to the Declaration of Helsinki [18]. This project ensures the protection of personal data, privacy, and anonymity of the volunteers following the European Parliament and the Council of 27 April 2016 on the protection of natural persons regarding the processing of personal data and the free movement of such data, and its regulation in Spain through Organic Law 3/2018 of 5 December. Approval was obtained from the ethics committees of the CEIof IDIAP Jordi Gol in Catalonia (code 22/060-P) on May 3, the CEIm of Cantabria (code 2022.034) on March 15, and the CEIm of Asturias (code CEImPA 2022.223) on May 17. The anonymous survey was distributed through various channels, including the Midwifery Associations, and Primary Care health centers, as well as by the gynecology and obstetrics service teams. The survey was also shared with women participating in parenting groups. The survey was distributed online, and it took approximately 10 minutes to complete. Informed consent was obtained from all participants included in the present study.

Data analysis

Data analysis was performed using the Stata v.15 statistical package (Stata Corp LLC, Texas, USA, 2017). Descriptive statistics were used to analyze quantitative variables, including measures of central tendency (arithmetic mean) and dispersion (standard deviation). Data presented a nonnormal distribution, as verified by the Shapiro-Wilk normality test. Qualitative variables were analyzed using absolute and relative frequencies for each category. The chi-square test and Fisher's correction were applied as necessary to test associations between qualitative variables. A p-value ≤0.05 was considered statistically significant. To determine anxiety levels, the percentiles for adult women of the established scales for the Spanish population were applied [16]. Three categories were considered: low anxiety (below the 25th percentile), medium anxiety (between the 25th and 75th percentile), and high anxiety (above the 75th percentile). For SA scores from 0 to 10 indicated low SA, from 11 to 26 medium SA, and higher or equal to 27 high SA. For TA, the scores from 0 to 16 indicated low TA, from 17 to 30 medium TA, and equal to or higher than 31 high TA. Depression was classified into three categories: minimal (0-13), mild (14-19), moderate (20-28), and severe (29-63). To evaluate the presence of post-traumatic stress scores higher than 31 were identified as indicative of posttraumatic stress.

Results and Discussion

Sociodemographic data

The sample comprised 559 women with a mean age of 32.71 (SD 4.65). The 29.87% were pregnant at an average of 24.88 (SD 9.84) weeks of gestation, with 97% being singleton pregnancies and 2.78% multiple pregnancies. The remaining 70.13% were postpartum or in their first year of childbearing **(Table 1)**.

Table 1. Sociodemographic data of the participants (data from COPE-IS)

Variables		%	n
Type of pregnancy	Single	91.22	525
	Multiple	2.78	15
Number of pregnancies/children	First pregnancy/child	100	559
Birth year of children	2020	11.37	65
	2021	41.43	237
	2022	15.75	90
Subgroup type	Pregnant women	29.87	167
	Postpartum or parenting mothers	70.13	392
Gestational complications	Without complications	79.44	425
	Gestational diabetes	7.29	39
	Hypertension	6.36	34
	Small fetal size	4.67	25
	Short cervix	2.24	12
	Absence of breastfeeding	34.13	129
COVID-19 contagions	Mothers and pregnant women	45.97	257
	Children	27.69	108
Region	Cantabria	64	358

	Cataluña	27.37	153
	Asturias	8.59	48
Cohabitation	In couple	97.01	520
	With family or friends	1.87	10
	Single	1.12	6
Educational level	Secondary or higher education	5.77	31
	Intermediate studies or vocational training	23.09	124
	University or master's degree	68.16	366
	Doctorate studies	2.98	16
Employment situation	Full time	47.49	255
	Part-time	21.97	118
	Maternity leave	15.27	82
	Other forms of temporary permits	3.91	21
	Search for employment	3.17	17
	Unemployment	2.79	15
	Student	0.93	5
	Babysitter	4.47	24

Perception of care and emotional impact

Regarding the subjective perception of the care received, most of the participants reported feeling well-supported by the health personnel. In terms of changes experienced in healthcare attention, the aspects with the highest representation were the cancellation or reduction in the frequency of prenatal visits (64.50%), the change in the in-person attention format (23,05%), and the substitution of face-to-face care with virtual care (3.90%). Other modifications were the lack of a companion during delivery (12.88%) or the lack of access to pain relief procedures or medications (10.68%). Regarding changes in postnatal experiences, the most reported were the restrictions of family and friends' visits (74,53%) and difficulties in talking about emotional issues (6.23%). During the pandemic, most support groups were transferred to a virtual format, but 84.27% of the participants did not participate. The most significant needs identified by women were contact with other pregnant, postpartum women or mothers (32.58%), the necessity to have quick responses to concerns (32.16%), access to mental health care (15.67%), and increased dialogue with health professionals (8.24%). Finally, more than half of the participants reported moderate to significant worsening in stress levels or mental health. Also, the impact of the pandemic was perceived as negative by almost all the participants, being the main sources of stress related to COVID-19: their children (29.35%), the general well-being (19.25%), the condition of family members (16.64%), and the health issues (12.15%) **(Table 2)**.

Table 2. Perceived quality of care and emotional impact of Covid-19 (data from COPE–IS)

Variables			%	n
Support from health personnel	Pregnant participants	Very well	52.17	84
		Well	46.58	75
		Not feel well	1.24	2
	Mother participants	Very well	32.71	123
		Well	48.94	184
		Not feel well	18.35	69
Change in prenatal care	Pregnant participants	Significant deterioration	2.55	4
		Somewhat worsened	26.75	42
		Somewhat improved	3.82	6
		Unchanged	66.88	105
	Mother participants	Significant deterioration	27.13	102
		Somewhat worsened	46.54	175
		Somewhat improved	1.33	5
		Unchanged	25.00	94
Changes experienced	Cesarean section schedule		2.23	12

because of COVID-19		Scheduled delivery or cesarean section	0.56	3
		From hospital to center	0.37	2
		Of their referring professionals	1.67	9
		Cancellation or reduction of prenatal visits	64.50	347
		In-person attention format	23.05	124
		Transition to non-face-to-face visits	3.90	21
		Unchanged	3.72	20
Changes in postnatal experiences		No family or friends' visits (due to restrictions/lockdown)	74.53	275
		No breastfeeding or baby care support	2.44	9
		Do not talk about "baby blues" / emotional issues	6.23	23
		Unchanged	16.80	62
Changes experienced because of COVID-19		Cesarean section schedule	2.23	12
		Scheduled delivery or cesarean section	0.56	3
		From hospital to center	0.37	2
		Of their referring professionals	1.67	9
		Cancellation or reduction of prenatal visits	64.50	347
		In-person attention format	23.05	124
		Transition to non-face-to-face visits	3.90	21
		Unchanged	3.72	20
Changes to birth plans		Medication pain control	10.68	39
		Change of birth location	0.55	2
		Assistance in childbirth	12.88	47
		Personal healthcare provider not available	1.64	6
		Immediate separation from the baby	2.19	8
		Unchanged	72.05	263
Participation in virtual support groups		Yes	15.73	84
		No	84.27	450
Personal and family support needs		Increased dialogue with health professionals	8.24	40
		Information on how to reduce stress	5.98	29
		Access to mental health care	15.67	76
		Virtual support groups	5.36	26
		Interaction with other pregnant women	16.50	80
		Quick response to concerns	32.16	156
	Contact with other mothers and/or pregnant women		16.08	78
Changes in stress levels or mental health	Pregnant participants	Significant worsening	15.53	25
		Moderate worsening	50.31	81
		Slight worsening	1.86	3
		Unchanged	32.30	52
	Mother participants	Significant worsening	17.43	65
		Moderate worsening	52.82	197
		Slight worsening	0	0
		Unchanged	29.76	111
Impact of the outbreak of COVID-19 in various variables	Pregnant participants	Extremely negative	8.70	14
		Moderately negative	31.06	50
		Somewhat negative	55.28	89
		Without impact	4.97	8
	Mother participants	Extremely negative	14.17	53
		Moderately negative	38.77	145
		Somewhat negative	41.18	154
		Without impact	5.88	22
The major source of stress associated with COVID-19		In children	29.35	157
		In a couple	1.87	10

In close friends	1.87	10
In the community	0.75	4
In family members	16.64	89
Health problems	12.15	65
Access mental health care	0.37	2
Access baby care supplies	0.37	2
General wellbeing	19.25	103
Financial worries	4.30	23
No stress	13.08	70
No stress	13.08	70

Anxiety, depression, and post-traumatic stress

Trait anxiety was assessed to observe the anxious tendency or personality. The mean score was 26.88 (SD 5.94), and 73.43% of the participants had medium levels. State anxiety was assessed to observe anxiety levels in the specific situation of a perinatal or neonatal period during COVID-19. The mean score was 32.02 (SD8.38) and 65.89% of the participants presented high levels of SA. Depressive symptoms showed a mean score of 14.49 (SD=9.09). Considering categories, participants showed mainly symptoms for mild, moderate, and severe categories, being the most prevalent with a minimal degree of depressive symptoms (52.24%) **(Table 3)**. Finally, according to the PTSD questionnaire, no cases of post-traumatic stress were identified (data not shown).

Table 3. Anxiety (trait and state) and depressive symptomatology levels of the participants

Variables	M (SD)	(%, n)
State Anxiety M (SD)	32.02 (8.38)	525
Categories SA (%)	2.78	15
Low anxiety		0.00 (n=0)
Medium anxiety		34.11 (n=190)
High Anxiety		65.89 (n=367)
Trait Anxiety M (SD)	26.88 (5.94)	
Categories TA (%)		
Low anxiety		1.62 (n=9)
Medium anxiety		73.43 (n=409)
High Anxiety		24.96 (n=139)
Depressive symptoms M (SD)	14.49 (9.09)	
Categories (%)		
Minimal		52.24 (n=291)
Mild		21.90 (n=122)
Moderate		17.06 (n=95)
Severe		8.80 (n=49)

Psychosocial factors and their association with maternity-related variables

First, regarding SA, the results showed a relationship between SA scores and future concerns about childcare, and a relationship between SA and the support perceived by healthcare professionals. Second, regarding depressive symptoms, the results showed a relationship with future concerns about childcare, the support perceived by healthcare professionals, the use of virtual support groups, and the complications during pregnancy **(Tables 4 and 5)**.

Table 4. Depressive symptoms - Psychosocial factors and their association with COPE-IS variables

Maternity-related variables		Minimal	Mild	Moderate	Severe	X2	p
Complications	Yes	46	35	17	10	10.991	0,012*
	No	231	78	77	231		
Type of pregnancy	Single	274	112	90	47	2.342	0,505

	Multiple	5	5	3	2		
Support perceived by health professional	Very well	143	50	14	0	77.395	0,001**
	Well	105	54	67	33		
	Not feel well	30	13	12	24		
Use of virtual support groups	Yes	46	28	6	4	13.365	0.004*
	No	226	92	87	43		
Future care concerns	Yes	105	85	69	37	63.232	0,004*
	No	162	35	24	10		
Family unit	Living alone in a couple With others (relatives or friends)	264	116	91	47	6.176	0,404
		3	1	0	2		
		5	3	2	0		

Table 5. State Anxiety - Psychosocial factors and their association to COPE-IS variables

Maternity-related variables		Low	Medium	High	Chi2	p
Complications	Yes	0	31	77	2.421	0.120
	No	0	156	269		
Type of pregnancy	Single	0	183	340	0.161	0.689
	Multiple	0	6	9		
Support perceived by health professional	Very well	0	73	134	7.103	0.029*
	Well	0	101	158		
	Not feel well	0	15	54		
Use of virtual support groups	Yes	0	32	52	0.288	0.592
	No	0	157	291		
Future care concerns	Yes	0	81	215	19.445	<0.001**
	No	0	106	125		
Family unit	Living alone in a couple With others (relatives or friends)	0	185	333	1.071	0.585
		0	1	5		
		0	3	7		

This study aimed to gather subjective perceptions of the care received in healthcare centers and the emotional impact during the COVID-19 pandemic by women in the perinatal and neonatal periods. The study also measured anxiety levels, depressive symptoms, and post-traumatic stress, and analyzed the relationship between these psychosocial factors and maternal-related variables. The main findings revealed that although most women felt well supported by healthcare professionals, more than half experienced a worsening in their mental health and reported a negative impact of COVID-19 in their lives, showing higher levels of SA. The main changes in healthcare attention were the frequency and format of perinatal and neonatal visits, the lack of a companion during delivery, and the restrictions of family/friend visits. The main needs identified were the contact with other pregnant, and postpartum women and mothers, the need for quick responses to concerns, and an increased dialogue with health professionals. SA and depressive symptoms were related to future concerns about childcare and the healthcare professional's support, whereas only depressive symptoms were related to the virtual support groups and complications during pregnancy.

One of the main needs identified was the desire for more interaction with other mothers or pregnant women. This underscores the significance of support groups, a concept reinforced by various studies [19, 20]. The study of Harrison *et al*. (2020) [19] emphasizes the importance of these groups in reducing anxiety levels. In our sample, only around 20% of the participants attended virtual groups and their participation was related to less depressive symptoms. Virtual support groups are a useful alternative when in-person attendance is not possible, providing essential peer support. However, a study by Ciochón *et al*. (2022) [21] revealed that face-to-face support groups have a greater impact on reducing anxiety levels. Another study reported the main unmet needs among pregnant women during COVID-19, such as the restriction of visits from family/friends during childbirth and postpartum (92.4%), the absence of perinatal support groups (20.6%), and the reduction or cancellation of perinatal visits (16.65%).

Another need widely identified was related to mental health. More than half of the participants reported a moderate negative impact on their mental health due to COVID-19, showing high levels of SA. Recent findings demonstrated that both pregnant women and mothers experienced higher levels of anxiety because

of the pandemic [13], and in general, a worsening mental health [22]. The study of Radoš *et al*. (2018) [23], revealed that anxiety in the immediate postpartum period was a significant predictor of anxiety and depression in the late postpartum. Other studies found that in pre-pandemic periods there were mild depression levels, in contrast to moderate levels during COVID-19 [23-26]. Finally, regarding the relationship between psychosocial factors and maternal-related variables, our results showed that concerns about their babies' future care and not feeling well-supported by healthcare professionals were related to SA levels. A recent study conducted with a Spanish sample of pregnant women revealed that COVID-19 concerns and pre-existing mental health issues were identified as significant risk factors for high SA, whereas accessible healthcare with adequate protocols for prenatal care, and a proper follow-up were identified as protective factors [25]. Current research supported the hypothesis that alterations in prenatal visits, modifications in birth plans, and changes in the presence of family members and peer support were significant factors contributing to higher anxiety levels [14, 26]. Similarly, depressive symptoms were associated with pregnancy complications, with concerns about the future care of the children, virtual support groups, and support from healthcare professionals. Regarding posttraumatic stress, no cases were recorded. However, the study of Mayopoulus *et al*. (2021) [27, 28], collected stressors during the pandemic that increase the incidence of the disorder.

The findings of this study, combined with the well-established evidence that women in a perinatal and neonatal period are at higher risk for stress and a worsening in mental health, highlight once again the importance of providing psychological support for this group, consistent with recommendations from other authors [4, 29]. Similarly, the latest version of the "WHO Recommendations on Maternal and Neonatal Care for a Positive Postnatal Experience: Executive Summary" (2022) proposes psychosocial interventions to prevent postpartum depression and anxiety [18].

Strengths and limitations

The main strengths are the following. Firstly, the size and composition of the sample. A total of 559 primiparous women from different regions participated, forming a homogeneous study sample. Secondly, the study was conducted in a health emergency period which provides information from a vulnerable group in terms of what is needed to create a protocol for an integral accompaniment from the healthcare system. In terms of limitations, there are several to consider. Firstly, as this was a cross-sectional study, it was not possible to observe potential fluctuations during different periods of restrictions. Secondly, the study did not consider other potential factors that could influence anxiety levels, such as socioeconomic status or previous mental health issues. Additionally, the study lacked an assessment of other stressors related to the pandemic, such as changes in work or economic situations, which could have impacted participants' mental health.

Future directions

Future research could include the study of a comparative group. As indicated by Moyer *et al*. (2020) [30], a comparative group is necessary to analyze the specific impact of the pandemic compared to a period without the pandemic. Furthermore, it would be interesting to explore differences between groups of primiparous and multiparous women. Therefore, recruiting patients who are not having their first child would be beneficial as some studies suggest that anxiety levels are higher in primiparous [30].

Conclusion

To sum up, the study found that over half of women in the perinatal and neonatal periods during the COVID-19 pandemic reported a negative impact on their mental health, and, most women identified social support from peers, health professionals, or significant others as a main need. Therefore, it is crucial to prioritize psychological and emotional support for pregnant women and new mothers, especially during situations of future health emergencies, restrictions, vulnerability, or changes in accessibility to the healthcare system. The study highlights the relevance of providing an action protocol based on the needs identified, accessible to all the users of Primary Care Centers, to prevent mental health issues and to improve maternal and neonatal care.

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