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Attitudes and collateral psychological effects of COVID-19 in pregnant women in Colombia

Miguel Parra-Saavedra[1,2] | **Isis Villa-Villa**[3] | **José Pérez-Olivo**[4] | **Leidy Guzman-Polania**[5] | **Pablo Galvis-Centurion**[6] | **Álvaro Cumplido-Romero**[7] | **Dario Santacruz-Vargas**[8] | **Eliana Rivera-Moreno**[9] | **Saulo Molina-Giraldo**[10] | **Hernán Guillen-Burgos**[2] | **Edgar Navarro**[11] | **Karen Flórez-Lozano**[11] | **Amanda Barrero-Ortega**[12] | **Magdalena Sanz-Cortes**[13] | **Jezid Miranda**[1,14,15,*]

[1]Universidad Simón Bolívar, Barranquilla, Colombia

[2]Centro de Investigaciones Clínicas y Traslacional, La Misericordia Clínica Internacional, Barranquilla, Colombia

[3]AMMFA, Asociación de Medicina Materno Fetal del Atlántico, Barranquilla, Colombia

[4]Medifetal, Diagnóstico Prenatal y Terapia Fetal, Cartagena, Colombia

[5]Korial Group S.A.S, Medicina Materno Fetal Integral, Pereira, Colombia

[6]Norfetus, Unidad de Medicina Materno-fetal, Cúcuta, Colombia

[7]Ser Mujer, Unidad de diagnóstico ginecológico y prenatal, Sincelejo, Colombia

[8]FECOPEN, Federación Colombiana de asociaciones de perinatología y medicina materno fetal, Cali, Colombia

[9]UMAFEC Unidad materno fetal del caribe, Valledupar, Colombia

[10]Section of Fetal Therapy and Fetal Surgery Unit, Division of Maternal Fetal Medicine, Department of Obstetrics and Gynecology, Department of Obstetrics and Gynecology Fundación Universitaria de Ciencias de la Salud - FUCS, Hospital de San José, Bogotá, Colombia

[11]Departamento de Salud Pública Universidad del Norte, Barranquilla, Colombia

[12]Instituto de Cirugía y Terapia Fetal del Caribe, Barranquilla, Colombia

[13]Department of Obstetrics and Gynecology, Baylor College of Medicine, Houston, TX, USA

[14]Grupo de Investigación en Cuidado Intensivo y Obstetricia (GRICIO), Universidad de Cartagena, Cartagena, Colombia

Abstract

Objective: To assess clinical impact, psychological effects, and knowledge of pregnant women during the COVID-19 outbreak in seven cities in Colombia. Currently, there are uncertainty and concerns about the maternal and fetal consequences of SARS-CoV-2 infection during pregnancy.

Methods: A cross-sectional web survey was carried out including pregnant women in seven cities in Colombia. Women were evaluated during the mitigation phase of the SARS-CoV-2 pandemic between April 13 and May 18, 2020. The questions evaluated demographic, knowledge, psychological symptoms, and attitudes data regarding the COVID-19 pandemic.

Results: A total of 1021 patients were invited to participate, obtaining 946 valid surveys for analysis. The rate of psychological consequences of the pandemic was much larger than the number of patients clinically affected by the virus, with 50.4% of the entire cohort reporting symptoms of anxiety, 49.1% insomnia, and 25% reporting depressive symptoms. Poorly informed women were more likely to be younger, affiliated to the subsidized regime, and with lower levels of education.

Conclusion: The knowledge of pregnant women about SARS-CoV-2 infection is far from reality and this seems to be associated with an indirect effect on the concern and psychological stress of pregnant women in Colombia.

KEYWORDS

Anxiety; Coronavirus; COVID-19; Depression; Depressive symptoms; Mental health; Pregnancy; Sleep

[15]Centro de Investigaciones para la Salud Materna, Perinatal y de la Mujer, ESE Clinica Maternidad Rafael Calvo, Cartagena, Colombia

*Correspondence
Jezid Miranda, Centro de Investigaciones para la Salud Materna, Perinatal y de la Mujer, ESE Clinica Maternidad Rafael Calvo, Cartagena, Colombia.
Email: jezidmiranda@gmail.com

1 | INTRODUCTION

There is currently uncertainty regarding the impact of the infection caused by the severe acute respiratory distress syndrome coronavirus 2 (SARS-CoV-2) in pregnant women.[1-3] History has shown that emerging infections have a significant impact on the health of pregnant women and their fetuses,[4] with the highest risk of complications in pregnant women as in 2009 during the influenza A(H1N1) virus pandemic[5] and the serious fetal effects of the Zika virus as a more recent example.[6,7] However, descriptive series from high-resource countries published so far have reported a variable clinical course of coronavirus disease of 2019 (COVID-19) in pregnant women.[1,8-15]

On the other hand, according to recent publications, the indirect effects in public health of the COVID-19 outbreak will probably be more severe than the outbreak itself.[16] Although mortality rates for COVID-19 appear to be low in children aged under 5 years and in women of reproductive age, these groups might be disproportionately affected by the disruption of routine health services, particularly in low- and middle-income countries.[16] Finally, the indirect psychological effects of COVID-19 in the entire population are also high according to recently published data.[9,11]

There is a paucity of data from low-resource countries describing the direct and collateral psychological effects of COVID-19 on pregnant women, neither the relationship of the potential psychological effects with other factors such as her degree of information, education, or healthcare coverage. Thus, the aim of the present study was to survey pregnant women in order to evaluate the direct and indirect psychological impact during the COVID-19 outbreak.

2 | MATERIALS AND METHODS

A web-based cross-sectional survey of pregnant women was carried out. Pregnant women aged over 18 years were eligible to participate. Pregnant women, regardless of their gestational age, were evaluated during the mitigation phase of the SARS-CoV-2 pandemic between April 13 and May 18, 2020, in seven cities in Colombia. A standardized, self-administered questionnaire based on the knowledge, attitudes, and psychological effects, produced by the research group and adapted following WHO recommendations,[13] was sent to those patients whose providers were affiliated to the Atlantic Maternal Fetal Medicine Association (AMMFA) and the National Federation of Perinatology (FECOPEN) and who agreed to collaborate with the study. An electronic invitation to participate was sent to the patients' smartphones using a messenger app (WhatsApp), in which the objective of the survey was explained. Next, the link of the website of the survey was sent to mothers who voluntarily agreed to participate using the same messenger app.

Before the beginning of the study, 65 questionnaires were administered to pregnant women in the cities in which the principal investigators were allocated—Barranquilla, Cartagena, Cucuta, Sincelejo, Bucaramanga, and Valledupar—as a pilot test evaluating the expected time for completion of the survey, interpretation, and clarity of questions and instructions. Although those answer were not used in the final analysis, questions reported as unclear and/or difficult to answer were then modified or excluded before the initiation of the actual study.

The present study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of Hospital ESE Maternidad Rafael Calvo (Cartagena, Colombia) and the Institutional Review Board (IRB) at La Misericordia – Simon Bolivar University Medical Center (Barranquilla, Colombia). Electronic informed consent was obtained from each participant before starting the investigation. Participants were informed that the study was voluntary and would not have any impact on their clinical care. They were well-informed that they could withdraw from the study at any moment without providing any justification.

The questions included in the survey covered different aspects about the sociodemographic characteristics of the women and their knowledge and attitudes regarding the SARS-CoV-2 pandemic. Questions included in the survey were completed using a multiple-choice format, in which patients were encouraged to complete all questions by choosing their answer from three options (Yes, No, or Unknown). The survey employed is included in Supplementary File S1. The survey was structured as a total of 46 questions: 10 questions about the patients' general knowledge about the pandemic; 10 questions about their attitudes; 10 questions on the potential psychological effects; eight questions on the participants' demographic characteristics; and eight questions on their medical history. A combination of measures in the questionnaires were used to assess the psychological impact, depression, and anxiety. It also included questions about the development, or not, of symptoms associated with this respiratory infection, or if laboratory tests for SARS-CoV-2 were obtained and/or if different clinical complications or admission to hospital was indicated.

The mothers' knowledge about the impact of COVID-19 on their pregnancy was evaluated based on six judgment questions (Supplementary File S1). Each correct answer was given 2 points, an incorrect answer was given 1 point, and an uncertain answer was given no points (for a maximum score of 12 points and a minimum of 0). Participants with scores of 7 points or higher and less than 7 points were considered well and poorly informed, respectively. Questions within the survey were organized into five domains based on the content and information that were attempting to assess attitudes towards the virus, its psychological effects, and women's knowledge about complications from SARS-CoV-2. Finally, the fourth and fifth domains enquired about symptoms and tests performed.

For the statistical analysis, descriptive analyses were conducted to describe the demographic characteristics and the participants' knowledge about COVID-19. Given that questions in the first two domains were subjective, responses were analyzed using descriptive statistics to determine the percentage of participants selecting each survey response of the total number of participants who answered the question. Second, the frequency of psychological symptoms stratified by patient knowledge was reported, and χ^2 was used to compare the differences between groups. Linear regression was utilized to assess the association between knowledge of SARS-CoV-2 and participant characteristics. Data were analyzed using R software. P values of less than 0.05 were considered statistically significant (two-sided tests).

3 | RESULTS

A total of 1021 participants received the questionnaires; however, 65 patients collected during the pilot phase were excluded from the analysis. In addition, surveys from 10 patients were removed from the analysis due to incomplete data. Thus, a total of 946 surveys were included in the analysis (response rate of 92.6%). Table 1 describes the sociodemographic characteristic of the participants. Almost half of the participants were aged 25–35 years, 44% were nulliparous, and the majority of patients were in the second trimester of their pregnancy (median 24 weeks [interquartile range 17.2–31 weeks]). Regarding socioeconomic information, 58% of patients were covered by the Colombian contributory healthcare regime and 66% of the women reported having a level of education that was beyond secondary school (a mean of 8 years of schooling).

Clinical characteristics and psychological symptoms of the participants are presented in Table 2. Only 65 (6.9%) women reported having developed symptoms compatible with SARS-CoV-2 infection at the time of the completion of the survey. Regarding respiratory symptoms related to SARS-CoV-2 infection, the most frequently reported was cough (5.24%), followed by shortness of breath (3.6%) and fever (1.4%). Ten patients required hospitalization, nine were tested for SARS-CoV-2 using polymerase chain reaction (PCR), and five of them had the infection confirmed with a positive PCR result. Six patients (9.2%) who were symptomatic and were not tested required admission to the hospital in the following days. Of the five patients with positive PCR results, only one developed pneumonia for COVID-19, required

TABLE 1 Clinical characteristics of pregnant women assessed during the COVID-19 pandemic.[a,b]

Clinical characteristics	n=946
Maternal age (years)	
15–25	288 (30.9)
25–35	503 (54)
35–45	138 (14.8)
>45	2 (0.21)
Nulliparity	408 (44.2)
Multiple gestation	29 (3.1)
Gestational age (weeks)	24 (17.2–31)
Health insurance	
None	3 (0.3)
Subsidized regime	200 (21.4)
Contributory regime	549 (58.7)
Commercial health insurance	183 (19.6)
Maternal education	
Primary	62 (6.6)
Secondary	257 (27.3)
Technician	457 (48.5)
University	167 (17.7)

[a]Values are given as number (percentage) or median (interquartile range).
[b]Missing values: age (n=15), nulliparity (n=23), multiple gestation (n=12), health insurance (n=11), education (n=3).

admission to the intensive care unit, and had good evolution and posterior negativization of the PCR test.

The distribution of psychological symptoms is presented in Figure 1. The presence of symptoms associated with anxiety was reported by 50.1% of the women. Similarly, 49% of the participants reported insomnia and 25.4% reported symptoms of depression. Using the score for questions related to knowledge, participants were classified according to their level of knowledge about the disease and

TABLE 2 Clinical symptoms in pregnant patients in Colombia.[a,b]

Clinical symptoms	n=946
Fever (temperature >38°C)	13 (1.39)
Cough	49 (5.24)
Shortness of breath	34 (3.64)
Sore throat	10 (1.1)
Fatigue	178 (19)
Consulted due to symptoms	65 (7.08)
Tested with PCR for SARS-CoV-2	9 (0.95)
Positive PCR result for SARS-CoV-2	5 (0.52)
Required hospitalization due to COVID-19	10 (1.05)

Abbreviation: PCR, polymerase chain reaction.
[a]Values are given as number (percentage).
[b]Missing values: fever (n=12), cough (n=11), shortness of breath (n=11), sore throat (n=8), fatigue (n=10), consulted due to symptoms (n=28).

potential effects on their pregnancies. Participants with scores of 7 points or higher and less than 7 points were considered well and poorly informed, respectively. Based on the answers reflecting their knowledge about SARS-CoV-2, patients were classified as poorly or well informed (78.5% and 21.5%, respectively).

Table 3 describes patients' attitudes and fears according to their level of COVID-19–related knowledge. Patients who were classified as better informed about COVID-19 (score ≥7 points) were more likely to be covered by private insurance (43% had prepaid medicine), had a higher level of education (86.6% had a technical/college degree), and were in the older age range (83.3% were aged >25 years and 23% were aged >35 years). Those women with less knowledge about COVID-19 were significantly more likely to fear the effects that SARS-CoV-2 can cause to their pregnancies and they were more likely to consider a preterm delivery before the peak of the pandemic (both $P<0.001$) (Table 3). However, there were no significant differences in the rate of psychological symptoms or levels of fear among women, irrespective of their knowledge about SARS-CoV-2, with a minority of patients (n=15, 1.6%) considering terminating the pregnancy due to the fear of COVID-19.

4 | DISCUSSION

The principal findings of the present study are: (1) the collateral psychological impact of COVID-19 in the overall pregnant population is high, with as much as 50% of the participants describing symptoms of anxiety and 25% reporting symptoms of depression; (2) the level of

knowledge of pregnant women in Colombia regarding the potential deleterious effects of COVID-19 in pregnancy is low, with misconceptions about fetal death, vertical transmission, and desire to terminate the pregnancy; and (3) poorly informed women were more likely to be younger, with a lower level of education and subsidized healthcare coverage.

The pandemic was first reported in Latin America in late February 2020. The first case in Colombia was confirmed by real-time reverse-transcription PCR (rRT-PCR) on March 6, 2020. On July 27, 2020, there have been 257 101 reported cases with 8777 deaths and 131 161 recovered patients.[16] However, pregnancy status has not been included in the national statistics so far. Nevertheless, in agreement with a recent publication by Saccone et al.,[9] two-thirds of the pregnant women in the present study surveyed in Colombia showed symptoms associated with anxiety as well as concern about the vertical transmission of the virus and the effects on the fetus. It has been proposed that isolation, social distancing, and extreme changes in daily life may increase the risk of depression among vulnerable populations such as pregnant women. Therefore, it is of paramount importance to start assessing the psychological impact of the COVID-19 outbreak in daily practice.[9]

Currently, the clinical course of COVID-19 in pregnant women is not completely understood, but so far, publications from mainly high-income countries suggest minimal or no deleterious effects over the fetus and the pregnancy outcome.[1,2,8–13,17–21] Understanding the community's knowledge of SARS-CoV-2 can be an important tool when developing and implementing future COVID-19 educational strategies and interventions. The results from the present survey reflect the
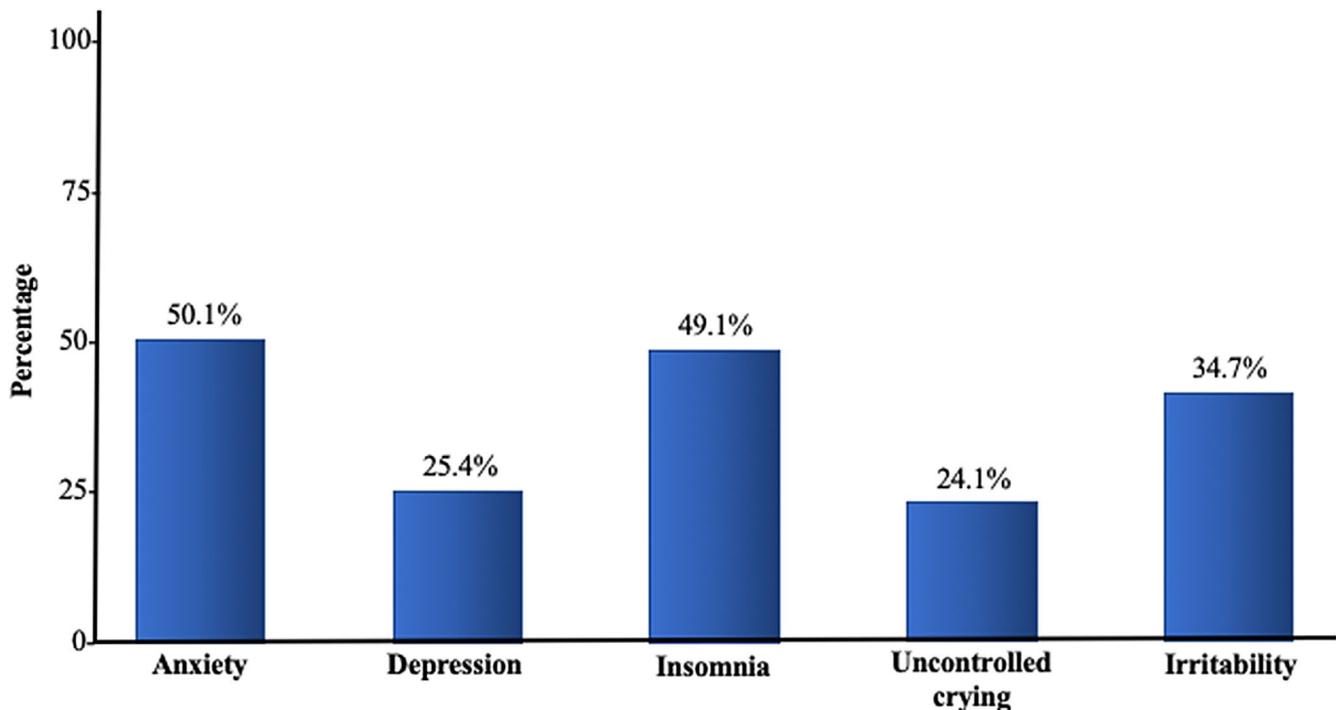
FIGURE 1 Distribution of symptoms of distress among pregnant women during the SARS-CoV-2 pandemic in Colombia. The presence of symptoms associated with anxiety was reported by 50.1% of the women. Similarly, 49% of them reported insomnia and 25.4% reported symptoms of depression.

TABLE 3 Attitudes and psychological symptoms in patients according to their knowledge about the effects of SARS-CoV-2 in pregnancy.[a]

	Poorly informed (n=722)	Well informed (n=219)	P value
Concern for SARS-CoV-2			0.25
Yes	659 (91.5)	194 (88.6)	
No	55 (7.64)	24 (11.0)	
Unknown	6 (0.83)	1 (0.46)	
Considered terminating the pregnancy due to fear of SARS-CoV-2 infection	10 (1.39)	5 (2.28)	0.21
Affected psychologically by the SARS-CoV-2 pandemic	369 (51.4)	114 (52.1)	0.41
Feels she should deliver prematurely before the peak of the pandemic			<0.001
Yes	80 (11.1)	18 (8.22)	
No	456 (63.2)	193 (88.1)	
Unknown	185 (25.7)	8 (3.65)	
Feels fear for the effects that SARS CoV-2 can have on her baby			<0.001
Yes	652 (90.6)	177 (80.8)	
No	38 (5.28)	39 (17.8)	
Unknown	30 (4.17)	3 (1.37)	
Scared when attending a medical appointment			0.3
Yes	504 (70.1)	142 (64.8)	
No	204 (28.4)	74 (33.8)	
Unknown	11 (1.53)	3 (1.37)	
Anxiety	356 (49.5)	113 (51.8)	0.57
Depression	185 (26.1)	50 (23.0)	0.09
Anger	273 (38.1)	76 (34.7)	0.36
Uncontrolled crying	179 (24.9)	47 (21.5)	0.43
Insomnia	351 (49.1)	107 (49.1)	0.72
Irritability	14 (1.97)	1 (0.46)	0.33

[a]Values are given as number (percentage).

general knowledge from Colombian society on this pandemic and its effects on pregnancy. The observed association between the patients' knowledge, their attitudes, level of education, type of assurance, and maternal age are thought-provoking. Older women with a higher level of education and higher socioeconomic status (based on their health insurance) showed a significantly higher knowledge on the effects of SARS-CoV-2 during pregnancy. This association is relevant and may reflect a group that is at higher risk for developing mental health complications during pregnancy or later. Specific educational strategies on COVID-19 and its effects on pregnancy are required for young pregnant women with less education and state insurance to help maintain

their psychological well-being during the current public health contingency. Finally, these findings can be used to formulate targeted psychological interventions directed at vulnerable groups identified in the present study. Among the limitations of the study is the non-probability sampling; thus, convenience sampling was used, which may have created bias. However, the number of patients surveyed (n=1021) in different regions of the country suggests that this is a sample representative of the reality of pregnant women in Colombia at this time of the outbreak.

In conclusion, the results from the present study suggest that although the number of cases of SARS-CoV-2 infections during pregnancy is still moderate in our environment, the COVID-19 pandemic may cause a major mental health burden in pregnant women. There are gaps in knowledge and information regarding multiple aspects of COVID-19 among pregnant women, including misconceptions about the risks of vertical transmission, risk of congenital malformations, and impact at the time and route of delivery as the most relevant points.

AUTHOR CONTRIBUTIONS

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CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

File S1. Coronavirus SARS-CoV-2 (COVID 19) and pregnancy survey.