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Review Article
Artigo de Pesquisa
Artículo de Revisión

Postpartum period and infection by the new coronavirus: a scoping review

Período pós-parto e infecção pelo novo coronavírus: revisão de escopo

Periodo posparto e infección por el nuevo coronavirus: revisión del alcance

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ABSTRACT
Objective: to map the evidence available in the literature about management and outcomes of postpartum infection by the new coronavirus. **Method:** scoping review conducted in four electronic sources, following Joanna Briggs Institute guidelines. Data were extracted, analyzed and summarized by four researchers independently. **Results:** nine of the 188 publications located were reviewed. The evidence, all obtained and published in 2020, was produced in six countries. These publications considered 21 cases of postpartum COVID-19, 15 (71.4%) of which related to severe developments / exacerbation of the disease and six (28.6%) diagnosed after hospital discharge. **Conclusion:** the mapping points to the occurrence of infection or worsening of the disease in the postpartum period, indicating the need for monitoring of signs and symptoms, diagnostic exploration and accurate treatment and the need for close monitoring of postpartum women diagnosed with COVID-19, whether symptomatic or not.
Descriptors: Women's Health; Postpartum Period; Coronavirus Infections; Review.

RESUMO
Objetivo: mapear as evidências disponíveis na literatura acerca dos manejos e desfechos da infecção pelo novo coronavírus no puerpério. **Método:** revisão de escopo conforme o *Institute Joanna Briggs*, desenvolvida em quatro fontes de dados eletrônicas. A extração, análise e síntese dos dados foi realizada por quatro pesquisadores independentes. **Resultados:** Nove publicações foram revisadas de 188 localizadas. Seis foram os países produtores das evidências, todas obtidas e publicadas em 2020. Vinte e um casos de COVID-19 no puerpério estiveram tratados nestas publicações, sendo 15 (71,4%) relativos a evoluções graves/exacerbação da doença e seis (28,6%) diagnosticados após a alta hospitalar. **Conclusão:** O mapeamento aponta para a ocorrência da infecção ou seu agravamento no período pós-parto, com indicativas ao monitoramento de sinais e sintomas, exploração diagnóstica e tratamento acurado e necessidade de acompanhamento próximo das mulheres diagnosticadas com COVID-19, sintomáticas ou não, no período pós-parto.
Descritores: Saúde da Mulher; Período Pós-Parto; Infecções por Coronavírus; Revisão.

RESUMEN
Objetivo: mapear las evidencias disponibles en la literatura sobre el manejo y los resultados de la infección por el nuevo coronavirus en el período posparto. **Método:** revisión del alcance según el Instituto Joanna Briggs, desarrollada en cuatro fuentes de datos electrónicas. La extracción, el análisis y la síntesis de los datos fueron realizados por cuatro investigadores independientes. **Resultados:** se revisaron nueve publicaciones de 188 encontradas. Fueron seis los países que produjeron las evidencias, obtenidas y publicadas en 2020. En estas publicaciones se trataron 21 casos de COVID-19 en el período posparto, 15 (71,4%) de los cuales estaban relacionados con evoluciones graves/exacerbación de la enfermedad y seis (28,6%) diagnosticados tras el alta hospitalaria. **Conclusión:** el mapeo apunta hacia la ocurrencia de la infección o su agravamiento en el posparto, con indicaciones de seguimiento de indicios y síntomas, exploración diagnóstica, tratamiento preciso y la necesidad de un seguimiento cercano a las mujeres diagnosticadas con COVID-19, sintomáticas o no, en el período posparto.
Descriptores: Salud de la Mujer; Periodo Posparto; Infecciones por Coronavirus; Revisión.

INTRODUCTION

The postpartum period begins with placental detachment and lasts up to one year after delivery[1]. It involves hormone and immunological changes[2], as well as physical, social and emotional adaptations[3], with indications to be treated as a "fourth gestational trimester" when differentiated care measures up to one full year after the end of pregnancy are recommended[3-5]. The notes are for continuous and longitudinal care in the postpartum period, with transposition of the trend to the single puerperal consultation, not attended by a mean of 40% of the women[3]. Also in this context, the importance that puerperal women with comorbidities receive differentiated care stands out, since hypertensive disorders, diabetes, obesity, thyroid disorders, kidney diseases, and mood disorders can have their symptoms exacerbated during the puerperal period[3].

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In the period from 2011 to 2013, American statistics recorded that 86.6% of the maternal deaths occurred in the puerperal period; 52.7% within 24 hours postpartum; 18.6% up to the first week; 21.3% between the first week up to 40 days, and 13.2% up to the 42nd postpartum day[6]. Data from Brazil's Department of Informatics of the Unified Health System (DATASUS) revealed that 66.5% of the maternal deaths in 2018 occurred in the puerperium[7].

COVID-19 is an infectious disease caused by the SARS-COV-2 virus, identified for the first time in China in December 2019, which spread worldwide, being declared as a pandemic in March 2018[8]. It made evident a number of gaps in the public health systems and social protection of the affected countries, surpassing the sanitary pandemic condition to become a social pandemic[8].

Puerperal women presented predisposition to infections and exacerbation of clinical conditions, being considered a priority and risk group for tracking and assistance in the infection by COVID-19[8]. The number of research studies on COVID-19 among pregnant and puerperal women has been presenting an exponential increase; however, due to nature of the studies (case studies and retrospective analyses), data are still limited and many questions remain clouded[9]. For this reason, it becomes a priority to compile the diverse evidence found and expand research on the theme, an intended aspect of this study.

The objective of this study consisted in mapping the diverse evidence available in the literature on the handling measures and outcomes of the infection by the new coronavirus in the postpartum period.

METHOD

A scoping review based on the Joanna Briggs Institute (JBI) method[10-13], with the research protocol recorded on the Open Science Framework (https://osf.io/n2z4m). In the "Population" scope, puerperal women was chosen, the "Concept" was the postpartum approach and clinical evolution and, as "Context", the SARS-CoV-2/COVID-19 infection, with laboratory confirmation by Polymerase Chain Reaction (PCR), considered a diagnosis reference standard. Thus, the review question was the following: "What is the available evidence on the handling measures and outcomes of the SARS-CoV-2 infection in the postpartum period?"

Data collection took place on October 01, 2020, and the searches were conducted on the US National Library of Medicine National Institutes of Health (PubMed), Latin-American and Caribbean Literature on Health Sciences (*Literatura Latino-Americana e do Caribe em Ciências da Saúde*, LILACS), Web of Science, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). The choice of the data sources was based on the number of indexed primary articles of the health area. The reading of titles, abstracts and descriptors determined the selection of studies for the review.

The studies included were those on the theme of COVID-19 infection with laboratory confirmation of the infection by PCR and postpartum period, published in Portuguese, Spanish, and English, dated 2020. Review studies, editorials, specialists' opinions, and those whose samples included puerperal women with clinical suspicion of the disease in their analysis were excluded. The level of evidence was not considered as an exclusion criterion because this is a new theme, with a reduced possibility of finding articles with a better level of evidence. A total of 188 articles were identified in the four databases analyzed, and the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology[12] was adopted to systematize the process for including studies (Figure 1).

Two reviewers, both PhDs, conducted searches independently, by means of controlled descriptors from the Medical Subject Headings (MeSH), CINAHL Headings, and the Descriptors in Health Sciences, with the following terms: "COVID-19", "Coronavirus Infections", and "Postpartum Period". The descriptors were combined in different ways, aiming to expand the searches. It is noted that the terminological variations in the different languages, as well as the synonyms, were used in the advanced and sensitized research, with the use of the Boolean operators *AND* and *OR* for the simultaneous occurrence of subject matters and for the occurrence of their respective synonyms, respectively.

Nine studies make up the *corpus* of this review. Their information was extracted from the instrument proposed by the JBI[14], which contemplated the identification of the article, year and locus of the study, the methodological characteristics, evaluation of the methodological rigor, the notes, and the discussions on the thematic focus of this review. For the evaluation of the methodological quality and the bias risk of the studies included, the JBI Appraisal Tools[14] were used.

Data were synthesized by two pairs of independent researchers and the inconsistencies found were discussed in the large group of researchers until reaching consensus. The information extracted was tabulated to synthesize the data and the analysis of the results occurred in a descriptive manner, with the presentation of a synthesis of each primary study included in this review. The rigor of data extraction and analysis was ensured with regular and in-depth discussions between the two pairs of researchers.

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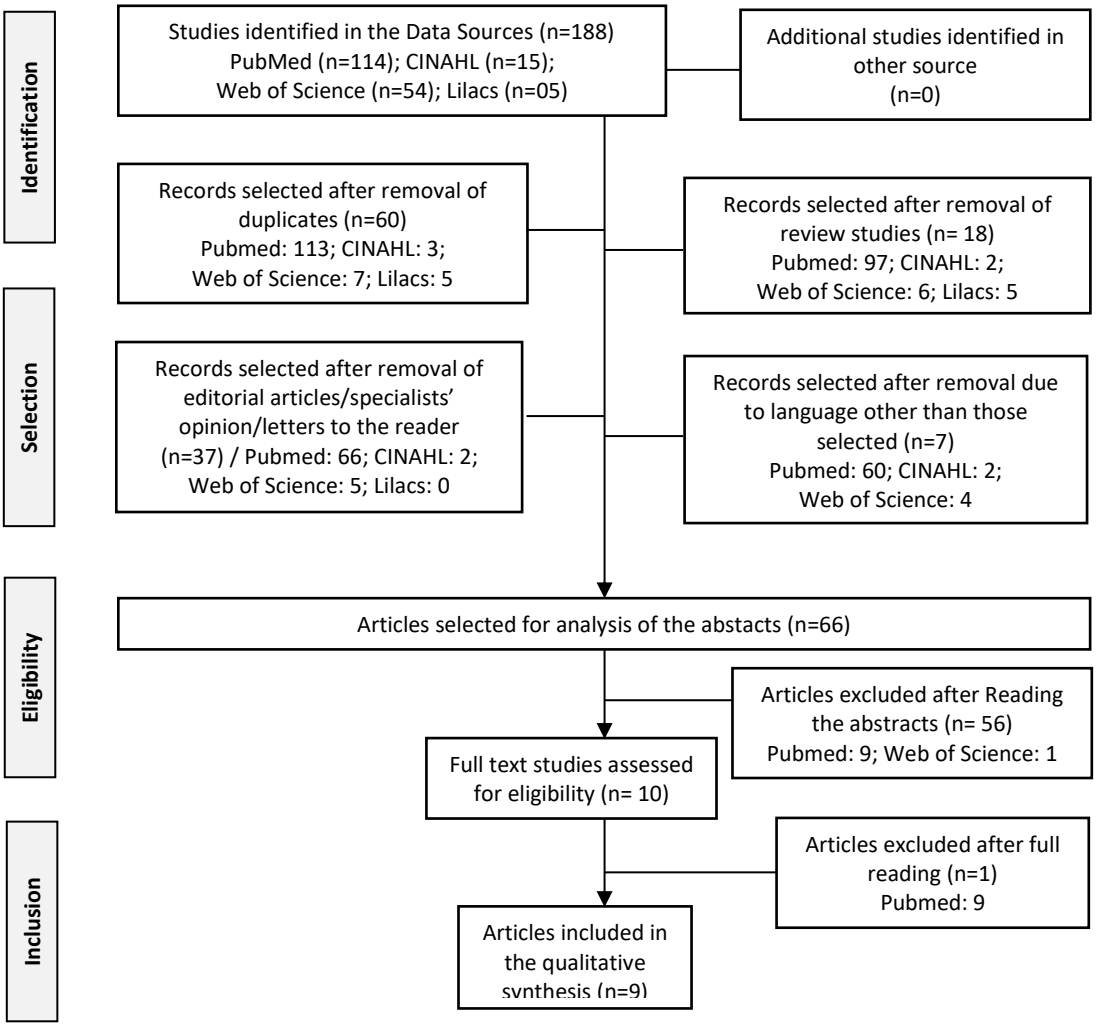

FIGURE 1: Flowchart of the selection of the review articles, according to PRISMA. Uberaba, MG, Brazil, 2020.

RESULTS

The nine articles included in this review contemplate cross-sectional studies with retrospective data derived from the analysis of medical records[15,16], studies of diagnosed or exarcebation of the cases in the postpartum period[18-23] and a prospective cohort aimed at outcomes in the obstetric population[17]. All published in English, in 2020, and conducted in the following countries: United States[15,17,19,22] (44.4%), Italy[16], Iran[18], Brazil[20], China[21] and France[23]. Figure 2 provides information about these studies.

To evaluate the methodological quality and the risk of bias, the JBI Appraisal Tools were adopted, with moderate risk of bias (scores between 50% and 70%) in a study[21] (11.1%), and low risk of bias (scores above 70%) in eight studies (88.9%)[15-20,22,23]. The article classified with moderate risk of bias[21] was maintained given the specificity for the focus of this review; it dealt with the exacerbation of the infection by SARS-CoV-2 in the postpartum period. Among the articles with low risk of bias, the most neglected item was the detailed description of the treatments used, mentioned in some cases, but ignored in others. It is emphasized that three articles[15,18,19] (33.3%) presented the maximum score in the methodological evaluation.

In total, the results of 768 pregnant women were analyzed and investigated for COVID-19; of them, 148 (19.3%) had diagnostic confirmation of the infection. Among the infected women, with laboratory confirmation, 21 cases (14.2%) in the postpartum period were described, with 15 (71.4%) addressing severe and exacerbated evolutions of the disease in the postpartum period, and six (28.6%) puerperal women, who were diagnosed after hospital discharge.

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Country	Objectives	Design/ Participants	Main findings/ Outcomes	Studies recommendations	JBI
United States[15]	To report COVID-19 cases among the obstetric population assisted in two American hospitals between March 13 and 27, 2020.	A cross-sectional study with retrospective data/ 43 medical records of pregnant women with a diagnosis of COVID-19 by PCR.	It describes a case of infection in the postpartum period after discharge (6th postpartum day and 7th day of infection) and two cases of disease exacerbation in the postpartum period.	Universal testing of the obstetric population and guidelines for the prevention of neonatal transmission – distancing from the neonate and breastfeeding with mask and rigorous hand hygiene.	100%
Italy[16]	To report the type of delivery and neonatal outcomes in pregnant women infected with COVID-19 in Lombardy, Italy.	A cross-sectional study with retrospective data/42 cases of women diagnosed with COVID-19, during screening in labor/delivery.	Five cases (12%) of infection detected among puerperal women, with fever as the main symptom. Two puerperal women performed skin-to-skin contact and breastfed without a mask, and their neonates were infected (positive PCR).	The possibility of infection in the postpartum period cannot be ruled out. Universal testing and prophylactic measures against vertical transmission are recommended.	89%
United States[17]	To report universal testing results in pregnant women in three New York institutions.	Prospective cohort/675 pregnant women	Two puerperal women (2.8%) present disease exacerbation in the postpartum (hypoxia); three (4.3%) needed to be readmitted after discharge, and nine (12.9%) presented puerperal complications associated with COVID-19. An important worsening in the infection was observed seven days after delivery.	The need to offer guidance to the puerperal women about risk factors for the infection was emphasized, monitoring pulse oximetry at home, and remote monitoring of the cases by health professionals.	83%
Iran[18]	To report a case of pulmonary embolism due to COVID-19 detected in the postpartum period.	Case study/one puerperal woman	Description of the case of a puerperal woman, with a history of previous abortions, 5th day after cesarean section, with COVID-19 that evolved with thromboembolism after discharge. The pregnancy, postpartum period, and cesarean section lead to hypercoagulability states, favoring embolism cases.	Chest CT is recommended for all pregnant women diagnosed with COVID-19, and specifically puerperal women with symptoms.	100%
United States[19]	To report the case of a puerperal woman with COVID-19 at the beginning of the pandemic and the differential diagnosis of the condition with preeclampsia.	Case study/ one puerperal woman	A case report of infection diagnosis in an obese puerperal woman, with chronic hypertension and anemia, who evolved with respiratory symptoms, a preeclampsia condition being investigated. She was diagnosed with COVID-19 on the 12th day after delivery (6th day of infection).	COVID-19 is associated with cardiovascular complications, thus being necessary to make effective the differential diagnosis of preeclampsia. The use of X-ray, electro and echocardiogram, troponin, and natriuretic peptide exams were effectively adopted in this case.	100%
Brazil[20]	To describe two COVID-19 cases in pregnancy with formation of pulmonary microthrombi after cesarean section.	Case study/ two pregnant woman	Description of two cases of infection exacerbation in the postpartum period, which evolved with pulmonary microthrombi. Both women were obese and were subjected to a cesarean section.	The increased risk for the formation of microthrombi in COVID-19 cases associated with the cesarean section is cautioned against.	87%
China[21]	To describe three cases of COVID-19 exacerbation in the postpartum period.	Study case/ three pregnant women	Infection exacerbation in three puerperal women is described, where decompensation of the condition occurred abruptly. The cases suggest that the changes in the postpartum enhance the decompensation risk and can exacerbate the COVID-19 condition in the first days postpartum.	The importance of a rigorous evaluation of thermal and respiratory signs associated with COVID-19 prior to discharge is emphasized.	50%
United States[22]	To report a COVID-19 case in pregnancy with respiratory impairment.	Case study/ one pregnant woman	Report of a severe COVID-19 case in pregnancy with severe respiratory impairment, with improvement after resolution of pregnancy.	It is suggested that resolution of pregnancy (delivery) may improve the respiratory condition in pregnant women infected with SARS-Cov-2.	88%
France[23]	To report a case of using extracorporeal membrane ventilation in the postpartum period.	Case study/ one puerperal woman	A successful experience is described regarding the improvement in the condition in the postpartum period, after birth, and the use of extracorporeal membrane ventilation.	Extracorporeal membrane ventilation is indicated for severe COVID-19 cases.	88%

FIGURE 2: Synthesis of the articles selected for the "Postpartum period and COVID-19: A scoping review" study (n=9). Uberaba, MG, Brazil, 2020.

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The studies make explicit the use of diagnostic exams to monitor the evolution of the COVID-19 condition when, among the imaging ones, chest CT[15,18-23] to explore the extension of the lung parenchyma lesion and suspicion of thromboembolism. The studies show a situation with comorbidities (obesity and hypertensive syndromes, among others)[19,22,23]; they describe drug therapies (enoxaparin; antivirals, antibiotics, and hydroxychloroquine)[15,17,18,20,22,23] and oxygen support treatments[17,20-22]. They also deal with the time[18,19] in which worsening of the COVID-19 condition in the postpartum period occurs and the usual signs[16,18,19,21], when fever, cough, and respiratory discomfort were highlighted.

DISCUSSION

Despite the complexity and criticality of the postpartum period, with the need for differentiated care measures[24], the studies associating it with COVID-19 are scarce.

In the evaluation of the incidence of COVID-19 cases in the postpartum period, a variation from 4.4% to 15.4% was identified[25,26]. A cohort study conducted in Spain from March to late May pointed out 91 women in the pregnancy-puerperal cycle with infection, of whom four were puerperal (4.4%); the diagnosis occurred between one and six days postpartum, and only one needed to be hospitalized. Obesity and the occurrence of fever were associated with greater severity of the cases[25]. Another study on the hospitalizations in ICU in Sweden pointed to a frequency of 15.4% of puerperal women, when only the hospitalizations in the obstetric population are analyzed. It is emphasized that the risk was increased in obese and diabetic women. Thus, in relation to the general population, being pregnant or in the puerperal period increased the risk for the need of intensive care measures[26]. The notes above were, somehow, addressed in the studies of this review.

Being diagnosed with COVID-19 while pregnant increases the chances of exacerbating the condition in the postpartum period[27,28]. This is due to abrupt changes in the hormones and postpartum immunity, given that to compensate for the stress of delivery, there is an increase in immunity, with a reduction in the level of cortisol; increase in leukocytes, lymphocytes, and PCR level, predisposing the puerperal woman to exacerbation in the presence of an infectious process[28].

In addition, an increased risk of thromboembolism is suggested in puerperal women affected by COVID-19. Hypercoagulability conditions increase the risk of thromboembolism and this event is frequently reported in the postpartum period. In the COVID-19 infection, changes in coagulation were demonstrated, which predisposes to the risk of thrombi formation; thus, thromboprophylaxis is to be considered, especially in women subjected to a cesarean section, which increases the risk of thrombi formation, and in women with comorbidities that predispose to the event. Thromboprophylaxis must be individualized and adapted to the condition of the pregnant/puerperal women[29].

Another nucleus mapped in this review concerns the rigorous attention to the COVID-19 symptoms in puerperal women. A case study of a 36-year-old obese puerperal woman, with infection evolution one week ago, and subjected to cesarean section due to respiratory decompensation, described the fast and abrupt deterioration of the clinical condition, with evolution to death in 36 hours after delivery[30]. Brazilian data point to the notification of 978 cases of severe acute respiratory syndrome in pregnant and puerperal women until mid-June 2020, with 124 evolutions to death, representing 12.7% of the cases. The mapping herein developed associated death cases with comorbidities, especially obesity, diabetes and cardiovascular diseases, as well as it brought data related to the symptoms at their onset. It is pointed out that puerperal women have 2.48 times more risk of evolving to death[31], highlighting the need for intensive care measures in the period, indications that are in line with was mapped in this review.

The differential diagnosis with other comorbidities, with confusing signs and symptoms, such as the hypertensive syndromes, makes the universal testing of the pregnant women be indicated for early detection of the infection by SARS-CoV-2. In this context, reflections related to the hospital infrastructure arise, whether in terms of diagnostic images, since the evidenced CT was as much a resource for the contribution to evaluating the evolution of COVID-19, as in the availability of ICU beds to assist all the severe cases, in face of the demand imposed by the COVID-19 pandemic. In this direction, when referring to laboratory exams, performing PCR is essential for diagnosis, with indications to obtain two negative results to discard the presence of infection[32-35].

We highlight that the mapping herein developed has a time frame as of the beginning of the pandemic, limit of this review; however, it allowed evidencing attention and interest nuclei, aiming at thinking about practices and research studies.

CONCLUSION

The review points out that there is a possibility that the COVID-19 infection occurs in the postpartum period, or of its exacerbation or worsening in this period. This review points to the relevance of the systematization of Nursing care in the postpartum period, as well as to the need to rigorously evaluate signs and symptoms, accurate diagnostic exploration, and the importance of maintaining a close monitoring of both asymptomatic and symptomatic women diagnosed with COVID-19 in the postpartum period, this consisting in the contribution of this study for Nursing.

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