**ORIGINAL ARTICLE**

# COVID-19 Fear Scale - Validation and adaptation for the perinatal period

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## Abstract

**Introduction:** The comprehensive effects on the mental health of the population due to the rapid global spread of COVID-19 are even more harmful to specific groups of individuals, including pregnant women.

**Objective:** To analyze the psychometric properties of the COVID-19 Fear Scale for Perinatal Period (EMC19-9).

**Methods:** This is a cross-sectional study with 204 pregnant women. Participants were recruited online through social networks. The criteria for participation in the research were: pregnant and aged 18 years or older. An electronic form was filled out, which included the preliminary Portuguese version of the COVID-19 Fear Scale (EMC19), containing the seven items in the original version and the two additional items related to pregnancy and baby, socio-demographic, psychosocial and related to pregnancy, as well as the validated Brazilian versions of the Perinatal Depression Screening Scale and the Perinatal Anxiety Screening Scale. The SPSS version 26 statistical package was used. For parametric measures, Pearson's coefficient and Student's T and non-parametric - Mann Whitney's U. And the magnitude of the correlation coefficients with perinatal anxiety and depression symptoms, Cohen's criteria. AMOS 26.0 was used for confirmatory factor analysis. For internal consistency, Cronbach's alpha.

**Results:** The results indicate that EMC-19-9 is a one-dimensional construct, has robust psychometric qualities, very good internal consistency of the questionnaire and shows convergent validity, has a moderate and significant correlation with perinatal anxiety and a significant, albeit slight, correlation with perinatal depression.

**Conclusion:** the Covid-19 Fear Scale for the Perinatal Period (EMC-19-9) has robust psychometric qualities and convergent validity. EMC-19-9 is a reliable and valid tool to assess the severity of fear of COVID-19 among women in the perinatal period in Brazil.

**Keywords:** fear, Covid-19, scale, validation, adaptation

**Authors summary**

**Why was this study done?**
This study aims to analyze the psychometric properties of the COVID-19 Fear Scale in the Perinatal Period (EMC19-9) with the construct validity (through confirmatory factor analysis / AFC) and the fidelity of this version, as well as its validity convergent, by assessing the pattern of correlations with measures of anxious and depressive symptoms in the perinatal period.

**What did the researchers do and find?**
EMC-19-9 has robust psychometric qualities, the internal consistency of the questionnaire is very good and shows signs of convergent validity. It has a moderate and significant correlation with perinatal anxiety and a significant, albeit mild, correlation with perinatal depression. In addition, the results seem to show the unidimensionality of the construct. EMC-19-9 is a reliable and valid tool for assessing the severity of fear of COVID-19 among women in the perinatal period in Brazil.

**What do these findings mean?**
EMC-19-9 can contribute to understanding fear, identifying people and groups at greatest risk, planning education and / or prevention aimed at programs to help overcome fear of COVID-19 and mobilizing those people to engage in preventive behaviors and to allow the evaluation of the effectiveness of strategies to prevent future emotional disturbances arising from this very unusual period.
We need a better understanding of how these impacts on mental health are linked to the pandemic phenomenon in conjunction with pregnancy and link the direction of public health campaigns that can help to alleviate suffering. More research is needed to find out where the vulnerability factors for emotional distress fit, especially in the perinatal period. Health services must proactively respond to pre-pregnancy psychosocial risk factors. Our study presents a scale that can measure the fear of COVID-19 in the perinatal period with regard to its results and can plan actions that aim to reduce the burden on health services and prevent long-term adverse effects for mothers and children.

## ■ INTRODUCTION

The comprehensive effects on the mental health of the population due to the rapid global spread of COVID-19 are even more harmful to specific groups of individuals[1], including pregnant women. In addition, the World Health Organization (WHO) classifies as a risk group for complications in the event of an infection by SARS-CoV-2, pregnant women at any gestational age, postpartum women up to two weeks after delivery and women who presented abortion or fetal loss.

The American Association of Gynecology and Obstetrics (ACOG) understands that many pregnant women are experiencing increased stress due to COVID-19[2]. ACOG encourages local facilities and systems, with the contribution of its obstetric care professionals, to develop innovative protocols that meet the health care needs of its patients, considering the emotional dimension of pregnant women in times of pandemic.

On July 18, 2020, the Brazilian Federation of Gynecology and Obstetrics (FEBRASGO) issues an Alert note on maternal deaths associated with COVID-19 which reinforces "the need to consider prenatal and childbirth care services as essential services and uninterrupted in the Brazilian territory at all levels of health care, and that pregnant women and puerperal women, being groups at risk of death by COVID-19, should have easy access to intensive care and hospitalization in ICU beds"[3].

A recent study4 shows that, until now, there have been more maternal deaths due to COVID-19 in Brazil than anywhere else in the world, according to available international reports. Even considering the different testing and notification strategies adopted in each country, Brazil may have a high incidence of adverse maternal outcomes during the COVID-19 pandemic compared to current data available from other countries[4]. Part of the data collection of the aforementioned study took place through conventional media, which shows how the cases have been disseminated to the general public reaching all people, including pregnant women. The result may be an increase in fear linked to anxiety and perinatal depression.

Another recent Brazilian study shed light on the disproportionate impact of COVID-19 on pregnant women and black mothers in Brazil[5]. The findings by Santos *et al.*[5] show that maternal mortality in black women due to COVID-19 was almost twice as high as that observed for white women in Brazil. The authors claim that this disparity should "draw our attention to the urgent need for containment measures focused on maternal health, which will require accurate and detailed analysis of all cases to support clinical decisions in the health system on a daily basis". The racial / ethnic profile needed to be present in this study given the disparity in the development and outcome of illness by COVID-19 in the country among black women.

It is known that fear is a central emotional response to imminent threats, such as COVID-19[6]. Fear is defined as an unpleasant emotional state that is triggered by the perception of threatening stimuli[7]. According to Pakpour and Griffiti[8], assessing fear is important when knowing the levels of fear about certain things between different groups due to specific sociodemographic variables (for example, sex, age, education, ethnicity, religiosity, etc.) to be able to know if education and prevention programs are needed and if they are needed which groups to target and where.

In an article written by anthropologist Catarina Barata, in the Portuguese newspaper "O Público", on August 2, 2020, it can be read that "in the face of the COVID-19 pandemic, many individual rights were suspended[9] advocated WHO recommendations[10], maternity hospitals were quick to impose restrictions on parturient preferences. The right to follow-up in most hospitals was suspended". On the matter, the anthropologist also mentions the increase in the number of inductions to labor performed without precise indication of births in the country.

Psychological factors play a vital role in the success of public health strategies used to manage epidemics and pandemics, says an editorial in the Journal of Anxiety Disorders[11].

These new tools can be useful to public health to better understand the correlations of fear of COVID-19 in the perinatal period, or to help identify people and groups at greatest risk. Psychologists could use the scale to see if the fear of COVID-19 is associated with specific personality traits. The grouping and application of this data can be used to plan education and / or prevention aimed at programs to help overcome the fear of COVID-19 and to mobilize these people to engage in preventive behavior.

Thus, this study aims to analyze the psychometric properties of the COVID-19 Fear Scale in the Perinatal Period (EMC19-9).

## ◼ METHODS

The participants were recruited online, through social networks. An invitation was presented to participate in the study, stating the objective and inclusion criteria - being pregnant, being over 18 years of age and being fluent in Portuguese. Participants who agreed to participate voluntarily gave their informed consent and then filled out a form in Google Forms, which included the preliminary Portuguese version of the COVID-19 Fear Scale (EMC19), containing the seven items from the original version and the two additional related to pregnancy and baby, some socio-demographic, psychosocial and pregnancy-related variables, as well as the validated Brazilian versions of the Perinatal Depression Screening Scale[12] and the Perinatal Anxiety Screening Scale[13].

These basically correspond to the validated Portuguese versions, by Pereira and collaborators[14,15], but the wording of the items was adapted to Brazilian Portuguese by two Brazilian researchers and confirmed as to their equivalence of meaning by two of the authors of the Portuguese versions[12,13].

### Fear of Covid-19 Scale/ COVID-19 Fear Scale for Perinatal Period

The Fear of Covid-19 Scale (FC19S)[16] is a self-completed questionnaire consisting of seven items to be answered on a 5-point Likert scale, from "Strongly disagree" to "Strongly agree". In the original psychometric study, a one-dimensional scale was considered, with factor loads ranging from .66 to .74.

As for internal consistency, Cronbach's alpha, of α = .82, was favorable, as well as the correlation coefficients between the items and the corrected total, from .47 to .74. The test-retest stability of .72 was also acceptable. The scores in the FC19S correlated significantly and positively with the perceived vulnerability, anxiety and depression, assessed using the Likert scale[16].

The Brazilian version of this scale[17] has already been demonstrated recently, resulting in a one-dimensional model with satisfactory adjustment indexes (X 2 /g.l.=2.135; RMSEA = .061; CFI, TLI, GFI & lt; .095). Cronbach's alpha coefficient was .876, demonstrating construct validity, as well as good internal consistency.

The process of translating the FC19S into Brazilian Portuguese was as follows: first, the original scale in English (v1) was translated into Portuguese by Brazilian researchers (v2). Then, the translated Portuguese version (v2) was translated back into English by a translation software (v3). Finally, Brazilian researchers compared the English version (v3) with the original version (v1), item per item, to determine whether they were equivalent in meaning.

Subsequently, a Portuguese researcher revised it so that the proposed version could be used in Brazil and Portugal, a process after which the final version in Portuguese, called the COVID-19 Fear Scale (EMC-19)[17], was obtained. Then two additional items were included, with content specifically related to pregnancy and the baby: 8. "I am afraid that something will happen in my pregnancy, childbirth or postpartum due to coronavirus-19" and 9. "I am afraid that my son is infected with coronavirus-19". The specific items of the perinatal period follow the previous seven with the same possible scale of answers.

### Perinatal Anxiety Screening Scale (PASS)[15]

To assess perinatal anxiety, the Perinatal Anxiety Screening Scale (ERAP) was used. This consists of 31 items developed based on the diagnostic criteria of the official international classifications [International Statistical Classification of Diseases and Related Health Problems - ICD 10 (1992)]; Diagnostic and Statistical Manual of Mental Disorders - DSM-5 (2013) for the various anxiety disorders. The frequency response range varies from "Never" (0) to "Almost Always" (3), so the total score can vary from 0 to 87, the more severe the symptoms, the higher the score is. In this sample, the Cronbach's alpha coefficient, of internal consistency, was .936.

### Perinatal Depression Screening Scale (PDSS-24)[14]

The 24 items of the ERDP correspond to symptoms that describe how the woman may be feeling during this pregnancy (last month) and to which she responds using a Likert scale, which ranges from "I strongly disagree" (1 point) to "I agree a lot" (5 points). The wording of the items refers to specific contents of the perinatal period, focusing on cognitive-emotional rather than somatic aspects. The higher the score, the greater the severity of the symptoms. In this sample, the Cronbach's alpha coefficient, of internal consistency, was .953.

### Statistical analysis

The statistical treatment was carried out with the program IBM SPSS Statistics, version 26 for Windows. Data processing was started by determining descriptive statistics, measures of central tendency and dispersion.

Given that the sample size is sufficient, taking into account the central limit theorem, parametric measurements and tests were used, such as Pearson's correlation coefficient and Student's T to compare average scores. When at least one of the groups in comparison was smaller than 30 and even if the t distribution with v degrees of freedom approached the normal distribution[18], the Mann Whitney U-equivalent test was applied.

The magnitude of the correlation coefficients was classified according to Cohen's criteria: low if less than .19; moderate if between .20 and .49 and high if greater than .50.

The AMOS 26.0 software was used for confirmatory factor analysis (AFC). The violation of the normal distribution was verified with the coefficients of asymmetry and kurtosis. The adjustment of the models was made based on modification indexes greater than 11, p <.001, produced by AMOS and based on theoretical considerations[18]. To assess the adequacy of the model, the following adjustment indices were used: $X2 / gl$, Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA).

For the analysis of internal consistency, we used Cronbach's alpha coefficient. In order to determine the particular contribution of each item to the internal consistency of the dimension, Cronbach's alpha coefficients were determined, excluding the respective items, and then compared with the overall alpha of the dimension. To ascertain the discriminatory power or internal validity of each item, the correlation coefficients were analyzed between each item and the total (excluding the item).

### Ethical and legal aspects

The study was approved by the National Research Ethics Commission of Brazil - CONEP, according to the attributions defined in CNS Resolution No. 510 of 2016, in CNS Resolution No. 466 of 2012 and in CNS Operational Standard No. 001 of 2013, which was expressed by the approval of the proposed research project with the number of the CAAE: 32934720.3.0000.5556, under the title: Perinatal Psychological Disorder in times of COVID. The data was treated with conditionality, equality and fairness. All procedures followed were in accordance with ethical standards. Informed consent was obtained from all participants included in the study.

### ■ RESULTS

### Participants

Between 19 June and 10 July 2020, 204 valid responses were obtained. The average age of the participants was 30.12 years (± 5.45), ranging from 19 to 42 years. The average number of weeks of pregnancy at the time of completion was 25.17 (± 6,553). The majority had an undergraduate degree or more (n = 153; 76.5%).

Regarding marital status, most were married or in a stable relationship (n = 128, 64.0%), with 57 (28.5%) single.

Regarding the race with which they identified themselves, the distribution was the following: white, n = 92 (46.0%); brown, n = 70 (35.0%); black, n = 30 (15.0%); indigenous, n = 1 (.5%) and yellow, n = 7 (3.5%).

In terms of their situation at work, 98 (49.0%) women were working, 69 (34.5%) were unemployed, five (2.5%) had a certificate and 28 (14.0%) said they were "in another situation", of which 19 (9.5%) stated explicitly that they were out of work due to the pandemic.

Close to 1/5 of the women (n = 34, 26.1%) were health professionals, and of these, 15 (7.5% of the total sample), are "top professionals", that is, with direct contact with patients. Only three (1.5%) participants did not live in Brazil (they lived in Portugal) and three others were not born in this country. If they had a choice, 191 women (95.5%) preferred normal birth and nine (4.5%), cesarean.

When asked if, in the last year, there was any life event that caused a lot of stress (Examples: Separation / divorce; Domestic violence; Death of a loved one; Serious illness; Unemployment), almost half of the sample, n = 95 (47.5%) replied affirmatively. As for the relationship with the partner, 170 women (85.1%) reported being good; 21 (10.5%) reasonable; one (.5%) participant characterized it as bad and eight indicated that they had no partner (4.0%).

Regarding their perception on receiving the help and emotional support they need from their partner, 6 (3.0%) and 16 (8.0%) answered "nothing" and "little" respectively. But in relation to other family members or friends, these proportions were 2 (1.0%) and 17 (8.5%), respectively.

### Construct validity

The initial AFC model of the perinatal version with nine items, as a one-dimensional measure, resulted in some unsatisfactory adjustment indexes (table 1). After correlating the five pairs of item errors (3 and 6, 3 and 7, 3 and 8, 6 and 7 and 8 and 9) with modification rates greater than 11[17], I obtained a very good adjustment (table 1, figure 1). Cronbach's alpha coefficient in this version was α = .890.

**Table 1:** Adjustment indexes of the tested models – EMC-19-9

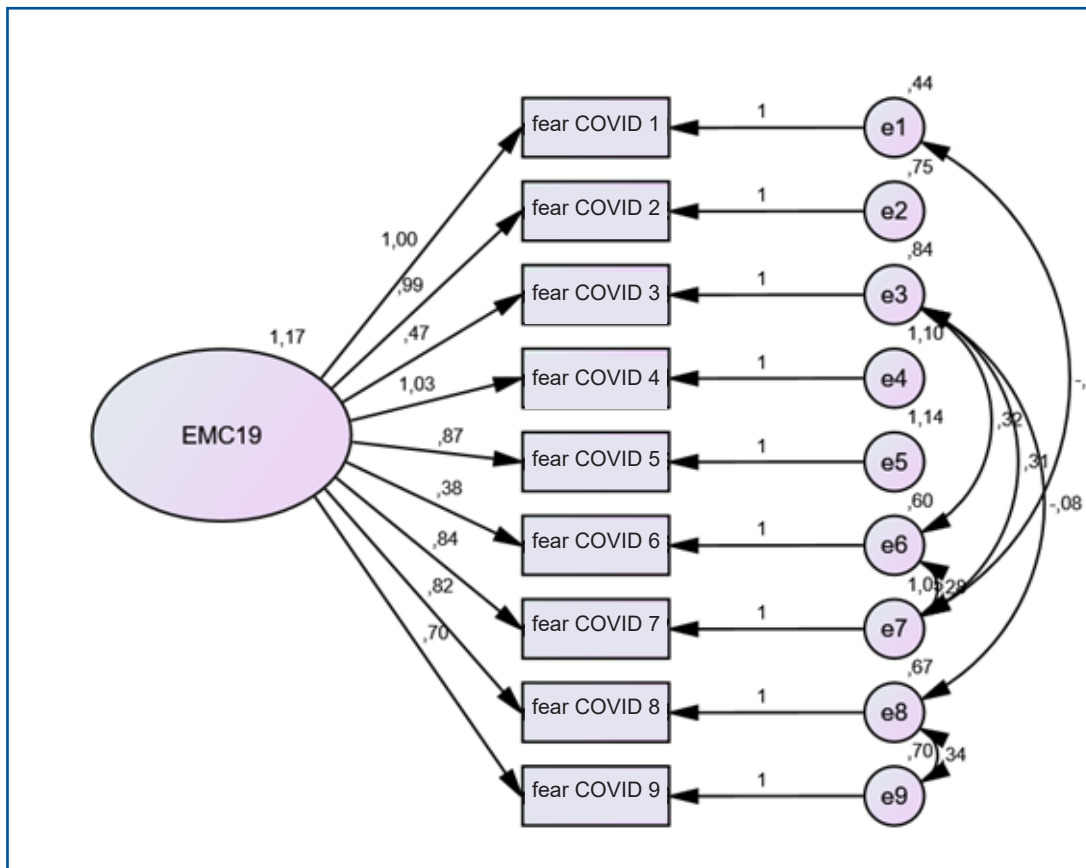| Models | Index | $\chi^{2/g.l}$ | RMSEA | CFI | TLI | GFI |
|---|---|---|---|---|---|---|
| Inicial Model | Adjustment indices | 6.866 | .162 | .825 | .766 | .808 |
| | Interpretation of values[23] | Bad | Unacceptable | Poor | Poor | Poor |
| Final Mod-el* | Adjustment indices | 2.480 | .076 | .964 | .941 | .947 |
| | Interpretation of values[23] | Good | Acceptable | Very good | Very good | Very good |

* With four pairs of correlated errors

**Figure 1:** Confirmatory factor analysis of the final model of EMC-19-9, with 3 pairs of correlated items.

## FIDELITY
### Internal consistency

Table 2 shows, other than the average score and standard deviation of each item, Cronbach's alpha with each item excluded and the item-total correlation corrected, for the 9-item version. It was found that all items on the scale contribute to internal consistency, as they showed corrected item-total correlations greater than .40, ranging from .525 (item 6) to .738 (items 1) in the adapted version of nine items; the exclusion of each item would cause the Cronbach's alpha of the total scale to decrease.

**Table 2:** Mean score and standard deviation for each item, Cronbach's alpha coefficients excluding the item and corrected item-total correlations in EMC-19-7 and 9 (N = 200)

| Items | Average | Standard deviation | Corrected item-total correlation | | Cronbach's alpha excluding the item | |
|---|---|---|---|---|---|---|
| | | | EMC19-7 | EMC19-9 | EMC19-7 | EMC19-9 |
| 1. I am very afraid of coronavirus-19. | 3.80 | 1.272 | .687 | .738 | .835 | .868 |
| 2. I am uncomfortable just thinking about the coronavirus-19. | 3.45 | 1.381 | .686 | .714 | .834 | .870 |
| 3. My hands get wet when I think of coronavirus-19. | 1.60 | 1.052 | .579 | .530 | .850 | .885 |
| 4. I am afraid of losing my life because of the coronavirus-19. | 3.32 | 1.535 | .651 | .689 | .841 | .873 |
| 5. When watching news and stories about coronavirus-19 in the media, I get nervous or anxious. | 3.35 | 1.430 | .614 | .631 | .846 | .878 |

**Table 2:** Mean score and standard deviation for each item, Cronbach's alpha coefficients excluding the item and corrected item-total correlations in EMC-19-7 and 9 (N = 200)

| Items | Average | Standard deviation | Corrected item-total correlation | | Cronbach's alpha excluding the item | |
|---|---|---|---|---|---|---|
| | | | EMC19-7 | EMC19-9 | EMC19-7 | EMC19-9 |
| 6. I can't sleep because I'm concerned about getting the coronavirus-19. | 1.52 | .879 | .564 | .525 | .854 | .886 |
| 7. My heart is racing when I think I can get coronavirus-19. | 2.13 | 1.384 | .686 | .656 | .834 | .875 |
| 8. I am afraid that something will happen in my pregnancy, delivery or postpartum due to coronavirus-19. | 4.20 | 1.207 | - | .687 | - | .873 |
| 9. I am afraid that my baby will be infected with coronavirus-19. | 4.31 | 1.126 | - | .644 | - | .877 |

### Convergent validity

To analyze this parameter, Pearson's correlation coefficients between the versions of EMC-19 and the scales of depressive and anxious perinatal symptoms were calculated. Table 3 shows that the versions of nine items have a moderate and significant correlation with perinatal anxiety; on the other hand, perinatal depression is significantly correlated, although the magnitude of the association is slight.

**Table 3:** Pearson's correlation coefficients between EMC-19-7, EMC-19-9, ERAP and ERDP.

| Scale | EMC-19-9 | ERAP |
|---|---|---|
| EMC-19-9 | 1 | |
| ERAP | .334** | 1 |
| ERDP | .160* | .770** |

*p<.05; **p<.001

### Average scores (per groups)

The average total scores on the EMC19-9 were 27.66 (± 8.29; range: 9-44). Table 4 shows the values corresponding to the percentiles (and quartiles) for the two versions.

**Table 4:** Values corresponding to Percentiles 5, 10, 15, 25, 50, 75, 85, 90 and 95

| Percentiles | EMC 19-9 |
|---|---|
| 5 | 12.0000 |
| 10 | 16.0000 |
| 15 | 19.0000 |
| 25 | 22.0000 |
| 50 | 28.0000 |
| 75 | 35.0000 |
| 85 | 37.0000 |
| 90 | 38.0000 |
| 95 | 41.0000 |

The race, categorized as white (n = 92, 46%) versus black / brown (n = 100, 50%), did not result in significantly different scores on the EMC-19-9 [t = -. 783 (190), p = .434)]. Also, the fact that the pregnancy was desired, at least by one of the parents (n = 154) or not (by both), (n = 56), does not seem to influence the fear associated with COVID-19 [Z = -. 741, (p = .460)], as well as the preference regarding the type of delivery EMC-19-9: [Z = -1.321, (p = .188)].

Psychosocial variables, such as having had a stressful event in the last year, the quality of the relationship with the partner and the perception of support also did not generate significant differences in the average scores of the two fear scales of COVID-19.

Among employed women, compared to unemployed, there were no significant differences in the EMC-19-9 scores [t = 1,116 (165), (p = .266)], not even considering the 12 participants who explicitly stated that they were out of work due to the pandemic [Z = -1.722, (p = .085)].

In relation to other professionals, health professionals did not present higher scores in the totals of EMC19-9 [t = -1.077 (198), (p = .283)]. However, if you consider only the "top professionals", you can see that they have significantly lower scores of fear of COVID-19, on the scale of nine items (22.00 ± 7.03) than the rest of the sample, which obtained averages of 28.19 ± 8.22 [Z = -2,992, (p = .003)]; even in comparison with other health professionals, those who work in the front line have lower scores than those [30.52 ± 7.33; Z = -2.947, (p = .003)].

Thus, pregnant health workers who work on the edge are subject to repeated and prolonged exposure to the risk of contamination by COVID-19, which leads to a reduction in anxiety. This would be the result of desensitization or habituation and they will respond with less fear to stimuli related to anxiety by COVID-19. Studies about the desensitization phenomenon start from the habituation model, which states that three conditions are necessary for the ideal benefit of exposures: 1) activation of fear, 2) minimization of anxiety-reducing behaviors and 3) habituation[19-22].

According to the habituation model, exposure is effective because it provides structured contact with

a feared stimulus, while minimizing the opportunity for avoidance, escape or ritualization[23]. It can be assumed that health professionals who work on the edge are exposed daily to the stress of COVID-19 and the risk of contamination, generating a reaction of habituation or desensitization. Habituation is related to decreased fear and cognitive changes[23].

Lang[24] suggests that fear reactions are composed of three response symptoms: verbal (*i.e.,* self-reported quantification of the level of anxiety), behavioral (for example, observable avoidance and avoidance behaviors that work to reduce anxiety and fear, as compulsive rituals) and physiological (for example, heart rate and skin conductance. This data is important for more studies to be carried out in order to deepen this supportive effect of exposure to COVID-19 and the consequences in increasing personal vulnerability, as well as the adoption of preventive behaviors by health workers, especially pregnant women, in which case the process of desensitization or habituation could have negative consequences.

## DISCUSSION

The threat of COVID-19 is particularly mysterious and unknown, which can trigger even more intense reactions in pregnant women. When she feels threatened, she reacts by activating defense mechanisms triggered by the activity of the survival circuits and fear is the most immediately triggered conscious emotion.

Fear and anxiety can be enhanced or minimized both by knowing or having more or less information, and by fear of the unknown related to expecting a baby.

Perceiving the threat of COVID-19 as serious was positively associated with preventive behaviors, suggesting that the perceived threat can be a motivational factor to smooth the progress of prevention, being a normal, functional response in the context of a pandemic[25]. However, further studies are needed to define the cutoff point, when through this value, you can consider fear above the functional. Lesser fear can also increase vulnerability.

Mental health interventions, with the increase in the psychological burden of the pandemic, are fundamental and understand as well as differentiate the normal fluctuation in suffering related to COVID-19, and how this is all enhanced when carrying another being in your body.

Functional limitations possibly due to extreme fear or even increased vulnerability due to the absence of fear are proposed challenges. Adherence to health measures is directly linked to the success of containing transmissibility[26]. One has to ask: What is the role of fear in the perinatal period in adhering to the behaviors followed by health services? The emotional cost of the pandemic among pregnant women remains to be understood and measured.

In this context, it is recommended to have an instrument to assess the fear of COVID-19 which affects the future mother. An attempt can be made to take the first step by adapting and validating the COVID-19 Fear Scale for the Perinatal Period, EMC-19-9. The results indicate that this first version has robust psychometric qualities, the internal consistency of the questionnaire is very good

and shows signs of convergent validity, has a moderate and significant correlation with perinatal anxiety and a significant, although slight, correlation with perinatal depression. In addition, the results seem to show the unidimensionality of the construct.

It points out the need for a study parallel to obstetrics that is dedicated to understanding everything that involves association between fear, health promotion and habituation. It is a process of great complexity, which, when evaluated, requires multiple constructs, but that can be inserted in a macro-construct that allows to encompass the interrelations that can be felt and experienced during pregnancy, however, this can only be made explicit in its entirety.

It needs a better understanding of how these impacts on mental health are linked to the pandemic phenomenon in conjunction with pregnancy and link the direction of public health campaigns that can help to alleviate suffering. "It is vitally important for everyone to concentrate efforts to understand the consequences of the COVID-19 pandemic on mental health and to find evidence-based ways of addressing these issues"[10].

The findings of the present study should be considered in the light of some limitations. The sample consisted of pregnant women basically from Brazilians. A formal diagnosis of mood disorders has not been made. In addition, the form of data collection through social networks limits access to those Brazilians with better socio-economic conditions, it cannot be excluded that social problems and convenience factors may have influenced the participants' responses to the questionnaire. Temporal stability has not been analyzed since we are under time pressure to have a valid instrument; that is, we considered that, given its urgency, there was no reason to wait two months for the re-test.

An investigation of larger and more representative samples of Brazilian participants is necessary to confirm the preliminary results provided by the present study. However, the total scores on the EMC-19-9 were comparable across all ages, which suggests that the EMC-19-9 is a good psychometric instrument to be used in assessing COVID-19 fears among Portuguese-speaking pregnant women.

More research is needed to find out where the vulnerability factors for emotional distress fit, especially in the perinatal period. Health services must proactively respond to pre-pregnancy psychosocial risk factors. This study presents a scale that can measure the fear of COVID-19 in the perinatal period so that its results can plan actions to reduce the burden on health services and prevent long-term adverse effects for mothers and children.

## CONCLUSION

The Covid-19 Fear Scale for the Perinatal Period (EMC-19-9) has robust psychometric qualities, the internal consistency of the questionnaire is very good and shows signs of convergent validity. EMC-19-9 is a reliable and valid tool for assessing the severity of fear of COVID-19 among women in the perinatal period in Brazil.

EMC-19-9 allows planning education and / or prevention aimed at programs to help overcome the

fear of COVID-19 and mobilize these people to engage in preventive behaviors and allow assessment of the effectiveness of strategies to prevent future emotional disorders arising of this very unusual period.

### Author Contributions:

All authors contributed to the conception and design of the study. Material preparation, data collection and analysis were carried out by Monalisa N S Barros, Ana Telma Pereira, Marcella Aguiar, Frederica Carvalho and António Macedo. The first draft of the manuscript was written by Monalisa N S Barros and Ana Telma Pereira. All authors commented on previous versions of the manuscript. All authors read and approved the manuscript.

### Conflicts of Interest:

There is no conflict of interest.

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**Resumo**

**Introdução:** Os efeitos abrangentes sobre a saúde mental da população em razão da rápida disseminação global da COVID-19 são ainda mais perniciosos para grupos específicos de indivíduos, incluindo as gestantes.

**Objetivo:** Analisar as propriedades psicométricas da Escala de Medo da COVID-19 no Período Perinatal (EMC19-9).

**Método:** Trata-se de estudo transversal com de 204 gestantes. As participantes foram recrutadas online por meio das redes sociais. Os critérios para participação na pesquisa foram: grávidas e com idade de 18 anos ou superior. Houve o preenchimento de formulário eletrônico, que incluía a versão portuguesa preliminar da Escala de Medo da COVID-19 (EMC-19), contendo os sete itens da versão original e os dois adicionais relacionados com a gravidez e bebê, variáveis socio-demográficas, psicossociais e relacionadas com a gravidez, bem como as versões brasileiras validadas da Escala de Rastreio da Depressão Perinatal e da Escala de Rastreio da Ansiedade Perinatal. Utilizou-se pacote estatístico do SPSS versão 26. Para medidas paramétricas, o coeficiente de Pearson e o T de Student e não-paramétrica – U de Mann Whitney. E a magnitude dos coeficientes de correlação com sintomatologia ansiosa e depressiva perinatais, os critérios de Cohen. Usou-se o AMOS 26.0, para a análise fatorial confirmatória. Para consistência interna, o alfa de Cronbach.

**Resultados:** Os resultados indicam que a EMC-19-9 é um construto unidimensional, possui qualidades psicométricas robustas, consistência interna do questionário muito boa e mostra ter validade convergente, apresenta correlação moderada e significativa com a ansiedade perinatal e correlação significativa, apesar de ligeira, com a depressão perinatal.

**Conclusão:** A Escala do Medo do Covid-19 para o Período Perinatal (EMC-19-9) possui qualidades psicométricas robustas e validade convergente. A EMC-19-9 é uma ferramenta confiável e válida para avaliar a gravidade do medo de COVID-19 entre mulheres em período perinatal no Brasil.

**Palavras-chave:** medo, Covid-19, escala, validação, adaptação.