

## ORIGINAL ARTICLE

## INFOGRAPHIC FOR PREGNANT WOMEN AND CAREGIVERS: EDUCATIONAL TECHNOLOGY IN THE CONTEXT OF OBSTETRIC CARE\*

### HIGHLIGHTS

1. Care for the prevention of Covid-19 during pregnancy and birth.
2. Guidance for pregnant women and accompanying persons on obstetric care in the maternity ward.
3. Educational technology to assist professionals in health promotion.
4. Infographic for preventing harm to the obstetric population.

Yany Suellen Pereira Cruz Oliveira<sup>1</sup> 

Roberta Costa<sup>1</sup> 

Margarete Maria de Lima<sup>1</sup> 

Manuela Beatriz Velho<sup>1</sup> 

Iris Elizabete Messa Gomes<sup>1</sup> 

Laís Antunes Wilhelm<sup>1</sup> 

Luana Pereira Ibiapina Coelho<sup>1</sup> 

### ABSTRACT

**Objective:** to describe the process of construction and validation of an educational infographic with guidelines for pregnant women and companions in obstetric care in the context of Covid-19. **Method:** methodological research based on *Instructional System Design* guidelines and conducted from January 2021 to March 2022, in the State of Santa Catarina - Brazil, in three moments: scoping review, interviews with nurses from an Obstetric Emergency, and elaboration of educational technology and validation with experts. The analysis was anchored in content analysis with Content Validity Index. **Results:** the infographic addresses care for the prevention of Covid-19 infection, guidance on the onset of labor, when to seek maternity care, and care during hospitalization of pregnant women. The infographic obtained a Content Validity Index of 83.3%. **Conclusion:** educational technology was considered adequate for disseminating information and assisting professionals in promoting health and preventing injuries to the obstetric population.

**DESCRIPTORS:** Educational technology; Health education; Pregnant women; Patient companion; Covid-19.

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## INTRODUCTION

The coronavirus (Covid-19) emerged in late 2019 and caused a pandemic in March 2020, leading to several complications and many deaths<sup>1</sup>. Pregnant and postpartum women were included in the risk group due to the physiological and immunological changes provided by pregnancy, making them more susceptible to complications and morbidity, and mortality from Covid-19<sup>2-4</sup>.

According to the Brazilian Obstetric Observatory Covid-19 (OOBr Covid-19), maternal deaths accounted for 1,482 in 2021, with a high case-fatality rate of 12.5%, representing more than three times the number of deaths reported in 2020. Brazil has the highest maternal mortality rate due to the novel coronavirus infection<sup>5</sup>.

As a result of this panorama, the routines of health services have been changed, and this has caused inconvenience to the population and health workers, making it essential to offer the best guidelines for this population to protect themselves from infection and avoid transmission of the disease<sup>7</sup>.

These changes caused difficulties and limitations in health care experienced within the Obstetric Emergency Service, among them: failures to follow the flow of care proposed by the hospital's contingency plan; omission of respiratory symptoms by pregnant women and companions; prohibition of the companion throughout the hospitalization of the pregnant woman; and the high number of telephone calls to the sector, to obtain information from the pregnant woman, interfering in the continuity of care.

Given the need to optimize the health service and such facts in the national scenario, it is understood that educational technologies are resources that enable the construction of learning, enhancing the knowledge acquired by the users of this technology<sup>8</sup>. Therefore, they become an important tool for disseminating information to the population and can minimize the problems experienced in practice through safer information to pregnant women and their companions<sup>8</sup>. Because of this process, the importance of nurses in ensuring care through health education, reception, and guidance stands out. In the context of the coronavirus pandemic, social distancing has favored a significant increase in the use of the Internet as a source of information. Thus, it contributed to less exposure of women in health institutions, facilitated the provision of guidance, and, consequently, prevented Covid-19<sup>9-11</sup>.

It is considered that technologies such as the internet, computer, notebook, tablet, and smartphones can collaborate to propagate this information process and also for this health education process to occur effectively<sup>12</sup>.

The infographic represents an important educational tool for nurses in health promotion and dissemination of guidelines; in this sense, this technology is a practical, easy, and objective resource that integrally relates images, symbols, and words and provides a better understanding of the content exposed<sup>13</sup>.

Given the risks for pregnant women and their families, the importance of the organization and quality of care in Obstetric Emergencies, and the efficiency of infographics as a technological resource in the teaching-learning process, the objective of this article is to describe the process of construction and validation of educational infographics with guidelines for pregnant women and companions in obstetric care in the context of Covid-19.

## METHOD

Methodological research of technological production based on Instructional System Design (ISD) guidelines. ISD assists in planning educational materials based on the identification and solution of an educational need, seeking efficiency and effectiveness in the expected learning<sup>14</sup>. This method divides the development of these educational actions into phases. It is known as the ADDIE model (*Analysis, Design, Development, Implementation, and Evaluation*), which in Portuguese means Analysis, Design, Development, Implementation, and Evaluation<sup>14</sup>.

In this study, aiming at organizing the infographic production, the ADDIE methodological proposal consisted of three moments: pre-production, production, and post-production. The pre-production moment represents the initial phase of production, being formed by the Analysis phase, in which the main doubts of pregnant women and their companions were identified based on interviews with five care nurses whom they have at least one year of practice in the unit and experience before and after the Covid-19 pandemic, and work in the Obstetric Emergency of a southern hospital, one year of practice in the unit and experience before and after the Covid-19 pandemic, and work in the Obstetric Emergency of a hospital in southern Brazil, and also in the scoping review of 25 publications to map the current evidence of care for pregnant women and guidance relevant to them and their companions in the context of Covid-19. This phase was carried out in the period from January to May 2021.

The data from the scoping review were organized into two thematic categories: Recommendations to pregnant women in the face of Covid-19 and Main information to pregnant women and companions in the obstetric service in the context of Covid-19. This material was organized into a manuscript for later publication.

The interviews were transcribed in full and then read, and repeated themes were highlighted for clippings. From these clippings, coding units were chosen due to common characteristics, separated by color, and organized in a table. With the coding units chosen, the next step was the categorization that allowed gathering a greater number of information and thus correlating classes of elements to order them, resulting in three thematic categories: Information relevant to obstetric care in the context of the Covid-19 pandemic; Suggestions for improvements in the care of pregnant women; and Strategies for the guidance of pregnant women and companions. The data were analyzed using Bardin's content analysis<sup>(15)</sup> and served as subsidies for the next phase.

At the time of pre-production, the Design phase was also developed, where the selection of contents and the structuring and design of the product were contemplated through the coding and categorization of the guidelines suggested in the interviews and the categorization of the information mapped in the scoping review. The content generated the guidance covered in the infographic.

At the time of production, the third phase of the ADDIE method was contemplated, Development, with constructing the infographic by collecting relevant information on the subject. Initially, the researcher constructed the text in *Microsoft Word*, addressing topics with the main information that should compose the material. Subsequently, it detailed each topic through items with relevant guidelines/recommendations, always paying attention to adapting a language suitable for the target audience. With the structure of the infographic ready, the researcher also suggested ideas for interactive and attractive images that could represent key points of the technology items. After constructing and structuring the infographic outline, it was sent to a professional graphic *designer*, who made the product creation possible. This took place in the period from June to October 2021.

In the post-production moment, the execution of the project is carried out, consisting of Implementation and Evaluation. The Implementation is the offer of the project, and it is in this phase that the validation of the product occurs. The Evaluation phase corresponds

to the evaluation of the technology produced, testing its operation from the analysis of the results of the guidelines against the proposed objectives so that the product is improved<sup>14-16</sup>. This last evaluation step was not carried out and will be conducted in a subsequent survey.

In this research, expert validation was conducted between November 2021 and March 2022 to ensure the quality of the product before it was distributed to the target audience. For selecting this validation committee, an intentional non-probabilistic sampling was used, with a minimum number of five and a maximum of ten participants<sup>17</sup>, selected from the curriculum in the *Lattes Platform*. The presence of the following criteria defined the experts: clinical experience in obstetrics, specialization course in obstetrics, master's degree and doctorate, and publication of research and articles in the area of interest.

In total, 56 experts were invited; of these, nine participated from different regions of the country. The validation was carried out in two rounds, and the results were evaluated using the Content Validity Index<sup>18</sup>.

The data collection instrument for the evaluation was a questionnaire in *Google Forms*, distributed in blocks, containing questions related to the identification data of the experts, evaluation of the content from the analysis of the clarity and relevance of the guidelines, and are understandable and adequate to achieve the proposed objectives and appearance of the illustrative images and structure of the educational technology.

To determine the validity of the infographic, the Content Validity Index (CVI) was used as a reference. To calculate the CVI, the content of each item was judged individually, as well as the overall content and, finally, the appearance of the infographic. The experts judged each statement through the Likert scale, with a score of one to four: 1- fully adequate; 2- adequate; 3- partially adequate; and 4- inadequate. The calculation was given by the sum of answers 1 and 2 assigned by the experts. The result is divided by the total number of answers.

In the first round, the desirable CVI was greater than or equal to 0.7, and items with CVI less than 0.7 were reviewed and reformulated according to the experts' suggestions. In the second round, only the items that had changed were validated. The overall CVI of the instrument was calculated by summing all the separately calculated CVIs and dividing by the number of variables<sup>18</sup>.

The study was approved by the Human Research Ethics Committee of the Federal University of Santa Catarina (UFSC), according to Opinion Number: 4.583.205.

## RESULTS

The infographic contains six topics, addressing care for the prevention of Covid-19 infection, guidance on the prodromal signs of labor and when to seek maternity care, guidance on what to bring to the maternity ward, guidance on hospitalization, and the necessary care for pregnant women and their companions.

The educational technology was developed based on the scoping review and themes reported in the interviews with the nurses. The contents described by the nurses were: suggestions for information regarding the presence and participation of the companion; information for pregnant women and their families about the signs of alarm and labor; what personal belongings the woman needs to take to the maternity hospital; hospitalization time; coronavirus prevention measures; the flow of care during the pandemic; and educational strategies for disseminating this information to the target audience.

The scoping review selected 25 studies and presented the main guidelines and

information for pregnant women and their companions in the context of the Covid-19 pandemic, such as correct use of masks; hand hygiene; respiratory etiquette; avoiding close contact with other people; the companion should not present flu symptoms; should avoid movement around the hospital; and not to change companions, culminating in content that contributed to the construction of the infographic. The researcher built the infographic's content with texts and images to facilitate understanding and contemplate all the necessary information.

The validation stage took place in two rounds, and the 38 items had their contents validated by experts. The group had nine experts in the first round and eight in the second round, most of whom were female (88.9%), aged 29 to 56 years, with an average age of 44 years, living in the Southeast region (43.9%), followed by the South region (33.3%) and the Midwest region (22.8%). All had a doctorate, and five were university professors (55.6%), three obstetric nurses (33.3%), and one doctor (11.1%). It was observed that the length of service ranged from six to 35 years, with an average of 18 years.

After the experts' evaluation, the CVI was calculated for each item. In the first round, 27 items (66%) achieved satisfactory agreement ( $\geq 70\%$ ). Items that did not achieve the expected CVI were adjusted according to the experts' suggestions.

To calculate the CVI, the content of each item was judged individually, as well as the overall content and, finally, the appearance of the infographic. At first, the clarity and relevance of the content of each topic were assessed, validating all the items of the six topics that make up the material. Next, the structure of the educational technology and the content, in general, were checked. Finally, the appearance, evaluating lines, shapes, colors, and images of the infographic, and whether these harmonized with the information content.

The experts were asked to judge each statement using a Likert scale, with a score of one to four, being 1- totally adequate, 2- adequate, 3- partially adequate, and 4- inadequate. The calculation was given by the sum of the answers 1 and 2 attributed by the experts for each item. The result is divided by the total of answers.

The desirable CVI was greater than or equal to 0.7 in the first round. When the CVI was lower than 0.7 for any criterion analyzed, the items' contents were revised and reformulated according to the experts' suggestions. Some items received suggestions from only one expert. However, regardless of the number of suggestions, these were analyzed and sometimes accepted, given the relevance of the suggestion. The decision to accept or not accept the suggestions was based on the relevant literature.

In the second round, only the items that underwent modifications were validated, of which 13 (54.2%) reached a CVI of 100%, seven (29.2%) reached a CVI of 83.3%, and four items (16.6%) were excluded with a CVI of 66.7%, according to the contributions of the expert committee. The instrument received an average CVI of 83.3%.

The infographic (Figure 1) consists of six topics, namely: care for coronavirus prevention; information on when to look for the maternity hospital, indicating which signs pregnant women should be alert to and seek care; guidelines on when to arrive at the maternity hospital; information on what items are needed to take to the maternity hospital; information pertinent to the pregnant woman and her companion about hospitalization; and information about discharge during the Covid-19 pandemic. In addition to addressing the guidance needs identified in nurses' practice, the infographic presents information dynamically and attractively, facilitating the understanding of pregnant women and their companions.

INFOGRAPHIC FOR PREGNANT WOMEN AND COMPANIONS IN OBSTETRIC CARE IN THE CONTEXT OF COVID-19

HOW TO PREVENT CORONAVIRUS?

- 1 STAY HOME
- 2 GET VACCINATED!
- 3 DO NOT ALLOW VISITORS
- 4 WEAR THE MASK CORRECTLY, COVERING MOUTH AND NOSE
- 5 AVOID CONTACT WITH PEOPLE WITH SYMPTOMS OF COVID-19
- 6 MAINTAIN PHYSICAL DISTANCING
- 7 AVOID CLOSED AND/OR CROWDED PLACES
- 8 AVOID TOUCHING YOUR FACE, MOUTH, NOSE AND EYES
- 9 WASH YOUR HANDS WITH SOAP AND WATER OR SANITIZE THEM WITH 70% ALCOHOL
- 10 DO NOT SHARE PERSONAL BELONGINGS
- 11 SEEK MEDICAL ADVICE IF YOU HAVE SYMPTOMS OF COVID-19



WHEN TO GO TO THE MATERNITY HOSPITAL?

IN CASES OF WARNING SIGNS:

- 1 VAGINAL BLEEDING
- 2 FEVER
- 3 HEADACHE AND BLURRED VISION, SEEING BRIGHT OR BLACK DOTS
- 4 SEVERE STOMACH PAIN
- 5 DECREASED OR LACK OF MOVEMENT OF THE BABY
- 6 LOSS OF GREENISH LIQUID FROM THE VAGINA
- 7 DIFFICULTY BREATHING OR ANY SYMPTOMS OF AGGRAVATION OF COVID-19 SEEK THE MATERNITY CARMELA DUTRA (REFERENCE IN OUR REGION)



IN CASES OF SIGNS OF LABOR:

- > REGULAR AND FREQUENT CONTRACTIONS (2 TO 3 CONTRACTIONS IN 10 MINUTES), THE BELLY BECOMES HARD
- > RUPTURE OF THE POUCH, YOU LOSE LIGHT-COLORED FLUID THROUGH THE VAGINA, IN LARGE QUANTITIES AND CONTINUOUSLY

**ATTENTION:** LOSING MUCOUS PLUG, WHICH IS A WHITISH SECRETION, PHEGEM-LIKE DISCHARGE THAT COMES OUT OF THE VAGINA, IS NOT A SIGN THAT YOUR BABY IS ALREADY GOING TO BE BORN



WHEN ATTENDING THE MATERNITY HOSPITAL:

- WEAR A MASK THROUGHOUT THE SERVICE
- IT MAY BE THAT DURING THE ASSESSMENT AT OBSTETRIC TRIAGE, A COMPANION IS NOT ALLOWED. BUT IF THE NEED FOR HOSPITALIZATION IS CONFIRMED, THEY CAN GO WITH YOU TO THE DELIVERY ROOM.

THE BABY IS COMING SOON! WHAT SHOULD YOU BRING TO THE MATERNITY?

- ✓ BABY BAG WITH TOWEL, CLOTHES, SOCKS, CAPS, BLANKETS, BIBS AND DISPOSABLE DIAPERS
- ✓ MOTHER'S BAG WITH PERSONAL HYGIENE MATERIALS (SOAP, TOOTHBRUSH, TOOTHPASTE, SHAMPOO, CONDITIONER AND ABSORBENT) AND CLOTHING
- ✓ PERSONAL DOCUMENTS (RG AND CPF), SUS CARD, AND PREGNANT WOMEN'S BOOKLET



WILL BE ADMITTED! WHAT IS THE CARE FOR PREGNANT WOMEN AND ACCOMPANYING?

- 1 WEAR A MASK THROUGHOUT THE HOSPITAL STAY
- 2 ALL PREGNANT WOMEN WILL BE ASSESSED FOR SYMPTOMS OF COVID-19 AT THE MOMENT ARRIVING FOR CONSULTATION
- 3 IT MAY BE NECESSARY TO TEST FOR COVID-19 AT THE TIME OF HOSPITALIZATION FOR THOSE PREGNANT WOMEN WHO HAVE NOT BEEN TESTED AT THE HEALTH CENTER OR WHO HAVEN'T COVID-19 IN THE LAST 03 MONTHS
- 4 COMPANIONS MUST ALSO UNDERGO SYMPTOM SCREENING BEFORE ADMISSION OF THE PREGNANT WOMAN TO THE OBSTETRIC SERVICE, COMPLETING AN INTERVIEW FOR COVID-19 CONTAINMENT MEASURES
- 5 PREGNANT HAVE THE RIGHT TO THE PRESENCE OF A COMPANION OF THEIR CHOICE THROUGHOUT LABOR, BIRTH AND THE PUERPERIUM
- 6 AS THE CONTINUOUS SUPPORT OF THE COMPANION DURING LABOR IMPROVES THE OUTCOMES OF CARE FOR WOMEN AND BABIES, HEALTH INSTITUTIONS HAVE BEEN UPDATING THEIR PROTOCOLS, ALLOWING THE PRESENCE OF A COMPANION DO A PRESEÇA DO DURING CHILDBIRTH AND ROOMING-IN ON A FULL-TIME BASIS AND WITH THE RELEASE OF VISITS.

ATTENTION!

YOU **DON'T** SHOULD OMIT ANY SYMPTOMS OF YOURSELF OR YOUR COMPANION. WHEN IN DOUBT, ALWAYS SHARE THE SITUATION WITH THE HEALTH PROFESSIONAL WHO IS TREATING YOU. THIS IS A PUBLIC SAFETY MEASURE, BUT IT IS ALSO IMPORTANT FOR THE CARE OF YOU AND YOUR BABY.

- 7 A MAXIMUM OF ONE COMPANION PER PATIENT IS RECOMMENDED DURING THE ENTIRE HOSPITALIZATION, AND MUST BE AGED BETWEEN 18 AND 59 YEARS, WITHOUT FLU-LIKE SYMPTOMS OR CONTACT WITH INDIVIDUALS WITH FLU-LIKE IN THE LAST 14 DAYS, LIVING IN THE SAME HOUSEHOLD AS THE PARTURIENT, AND MUST NOT BE FROM THE RISK GROUP FOR THE DISEASE (ELDERLY, IMMUNOSUPPRESSED AND PEOPLE WITH COMORBIDITIES).



- 8 THE APPEARANCE OF SYMPTOMS OF COVID-19 BY THE COMPANION AT ANY TIME DURING HOSPITALIZATION WILL IMPLY THEIR REMOVAL WITH GUIDANCE TO SEEK CARE IN AN APPROPRIATE PLACE

- 9 NO CHANGE OF COMPANION, TO MINIMIZE THE MOVEMENT OF PEOPLE IN THE HOSPITAL

- 10 COMPANIONS SHOULD BE RESTRICTED TO THE PLACE OF THE PREGNANT WOMAN CARE, AVOIDING AROUND THE HOSPITAL;

- 11 WHEN THE MOTHER AND BABY GO TO THE ROOMING-IN UNIT, THEY MAY NOT BE ALLOWED TO HAVE A COMPANION AND/OR ONLY VISITS AT PREDETERMINED TIMES. THE WOMAN WILL BE ACCOMPANIED BY THE NURSING TEAM

- 12 THE STAY OF THE COMPANION AFTER BIRTH IS BEING GUARANTEED IN SITUATIONS WHERE THERE IS INSTABILITY THE WOMAN'S CLINICAL CONDITION, OF THE NEWBORN OR IF THE WOMAN IS A MINOR

- 13 WHEN YOUR COMPANION IS NO LONGER PRESENT, YOU CAN KEEP IN TOUCH WITH THEM OR THEIR FAMILY BY CALLING THEM OF MOBILE VIDEO.

- 14 IF YOU AND YOUR BABY ARE WELL, YOU WILL BE DISCHARGED WITHIN 24 HOURS AFTER A NORMAL BIRTH OR 48 HOURS FOR A CAESAREAN

ATTENTION!

ALL PREVENTIVE CARE MUST BE MAINTAINED WHEN YOU GET HOME WITH YOUR BABY!

WASH YOUR HANDS

MAINTAIN THE PHYSICAL DISTANCE

STAY AT HOME

AVOID VISITS  
MINIMIZE EXPOSURE TO PEOPLE WHO DO NOT LIVE IN YOUR HOME

**Figure 1** - Infographic for pregnant women and companions in obstetric care in the context of Covid-19. Florianópolis, SC, Brazil, 2022  
Source: The Authors (2022).

The infographic is intended for pregnant women and their companions who seek care in the Obstetric Emergency of the institution where the research was developed. It will be implemented and evaluated during the post-production stage, on the institution's website and social networks, in the Basic Health Units of the municipality, to be disseminated and used by the target audience and health professionals.

DISCUSSION

The infographic with guidelines for pregnant women and their companions in obstetric

care was designed to conduct the care process and the nurse's health education work concerning pregnant women's and family members' doubts identified from the nurses' perceptions. In their care practice, nurses must welcome, care for, and guide clients and their families based on effective health education to provide quality of life to service users<sup>19</sup>.

Thus, the educational technology developed aims to offer differentiated assistance, with implications for nursing practice and obstetric health, showing that health education carried out by nurses is fundamental for the construction of knowledge by pregnant women<sup>20</sup>. To promote further dissemination of this knowledge, it is important to include the accompanying persons in this education process<sup>21</sup>. In this sense, the infographic guides the presence of companions at different stages of care for pregnant women/parturients.

The development of educational technologies allows nurses to act as mediators of activities in the health area, affirming their feasibility and applicability in practice<sup>19</sup>. Thus, the infographic was designed to assist the work of nurses in Obstetric Emergencies, being a tool to assist in effective, humane, and safe care. Through health education, it is possible to prioritize health demands, foster the creation of bonds between patients and professionals, and favor reception and humanized care<sup>22</sup>.

Corroborating the trend of using educational technologies, the infographic collaborates with the teaching-learning process, facilitating self-learning<sup>23</sup>. Studies have identified that learning through infographics is 6.5 times greater than reading text<sup>24</sup>.

An infographic is a tool that associates information of interest to the target audience and converges with the educational process, seeking understanding through simple communication and integrated with images and texts<sup>25</sup>. Infographics increase the possibility of information consumption by the target group<sup>26</sup>, facilitate health interventions, and motivate educational strategies, improving the effectiveness of their use<sup>27</sup>.

The instrument presents content and appearance validity, gathering potential to be used by pregnant women and their companions, and this ratifies the importance of validation by experts by ensuring the improvement of the content of the technology, the use of reliable information, easy to understand, ensuring credibility, reliability, practicality, and responsiveness, making it reliable, accurate and consistent.

As a limitation of the study, we highlight the fact that a stage of data collection was not carried out in the presence of pregnant women since the study took place in the middle of the pandemic, avoiding close contact with them and prolonging their exposure in a hospital environment, however, the interviews with nurses aimed to identify the doubts presented by women when seeking care in the Obstetric Emergency.

## CONCLUSION

The construction and validation of the infographic made it possible to identify the main doubts of pregnant women and their companions during their obstetric care, intending to minimize the discomforts generated by the pandemic moment and make available to the population an educational technology that can contribute to the dissemination of current and evidence-based information, which can have a positive impact on the care provided.

Therefore, the educational technology presented is expected to be an important technological resource in disseminating information among pregnant women and their families. It will also help health professionals in health promotion and prevention of injuries to the obstetric population.

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**Corresponding author:**

Yany Suellen Pereira Cruz Oliveira

Universidade Federal de Santa Catarina

Rua Coroa de Frade, 326, Areia Branca, Petrolina-PE

E-mail: yanysuellen@hotmail.com

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Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **Oliveira YSPC, Costa R.** Drafting the work or revising it critically for important intellectual content - **FOliveira YSPC, Costa R, Lima MM de.** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **Oliveira YSPC.** All authors approved the final version of the text.

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