

Original article

Women's perceptions about breastfeeding and COVID-19: subsidies for the development of a digital technology*

Percepções de mulheres sobre aleitamento materno e Covid-19: subsídios para o desenvolvimento de tecnologia digital

Percepciones de mujeres sobre la lactancia materna y la COVID-19: subvenciones al desarrollo de una tecnología digital

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Abstract

Objective: understanding women's perceptions about breastfeeding during the COVID-19 pandemic, with a view to supporting the development of a digital support technology. **Methodology:** qualitative study conducted through a participatory interview and the Thematic Content Analysis technique. **Results:** it had the participation of 12 pregnant women, 12 puerperal women and 12 lactating women. The 36 participants described doubts regarding COVID-19, breastfeeding and fear of virus transmission through breast milk. **Conclusion:** the importance of understanding these women's perceptions during the pandemic was emphasized, highlighting the challenges and the need to improve access to information and professional support.

Descriptors: Breast Feeding; COVID-19; Infant; Health Services; Digital Technology

Resumo

Objetivo: conhecer as percepções de mulheres sobre aleitamento materno durante a pandemia de COVID-19, visando subsidiar o desenvolvimento de uma tecnologia digital de apoio. **Método:** estudo qualitativo realizado por meio de uma entrevista participativa e da técnica de análise de conteúdo temática. **Resultados:** participaram 12 gestantes, 12 puérperas e 12 lactantes. Foram descritas pelas 36 participantes a dúvida em relação à Covid-19, à amamentação e ao medo da transmissão do vírus pelo leite materno. **Conclusão:** destacou-se a importância de compreender as percepções dessas mulheres durante a pandemia, evidenciando os desafios e a necessidade de ampliar o acesso à informação e ao apoio profissional.

Descritores: Aleitamento Materno; COVID-19; Lactente; Serviços de Saúde; Tecnologia Digital

Resumen

Objetivo: conocer las percepciones de mujeres sobre la lactancia materna durante la pandemia de COVID-19, con miras a apoyar el desarrollo de una tecnología digital de apoyo. **Metodología:** estudio cualitativo realizado mediante una entrevista participativa y de la técnica de Análisis de Contenido Temático. **Resultados:** participaron 12 embarazadas, 12 puérperas y 12 lactantes. Las 36 participantes describieron sus dudas sobre la COVID-19, la lactancia materna y el miedo a la transmisión del virus a través de la leche materna. **Conclusión:** se destacó la importancia de comprender las percepciones de estas mujeres durante la pandemia, subrayando los retos y la necesidad de ampliar el acceso a la información y al apoyo profesional.

Descriptores: Lactancia Materna; COVID-19; Lactente; Servicios de Salud; Tecnología Digital

Introduction

It is recommended that exclusive breastfeeding be maintained for the first six months of the baby's life, and its continuation until 2 years of age or beyond is ideal. Breast milk is considered the most complete food because it contains necessary nutrients, as well as antibodies that offer protection against infections. Additionally, it promotes maternal health by helping to prevent certain diseases and strengthens the mother-baby bond.¹ In addition to meeting the Sustainable Development Goals (SDGs) proposed as a strategy by the United Nations (UN), breastfeeding stands out for its practicality, economy and effectiveness for children's health.²

Currently, in Brazil, the exclusive breastfeeding rate (EBF) in infants up to 6 months of age is 45.8%, which is still below the target set by the World Health Organization (WHO), whose goal is to reach at least 70% of children in terms of EBF by 2030.³ During the COVID-19 pandemic, with the recommended social isolation, the breastfeeding process showed impacts that included behavioral changes and uncertainties in practices, due to the overwhelming amount of information constantly arriving about viral spread and the possibilities of transmission through lactation. Additionally, there was the reality of facing the labor process without a companion and puerperal women being separated from their children shortly after childbirth.⁴

The COVID-19 pandemic also had repercussions on the care directed towards the lactation process of these women. It was necessary to readapt in order to provide care not only in person but also virtually, with a view to maintaining contact. An example of this was the reorganization of health education groups on breastfeeding and baby care, which had to be adjusted, and many women began to seek information from informal

sources, lacking scientific rigor.⁵ Companies producing substitutes for breast milk have leveraged the extensive reach of social media and the vulnerability of mothers to drive appealing marketing strategies that induce the unnecessary use of infant formulas, competing with breastfeeding.⁶

Conversely, women who sought reliable information about COVID-19 and its relationship with breastfeeding reflected on the practice of breastfeeding and its mutual benefits during this period, which contributed to late weaning.⁷

In this context, the support of health professionals, especially nurses, is essential to strengthen women's confidence in breastfeeding. The nurse plays a critical role in developing actions that encourage and sustain this practice, contributing to the dissemination of information through evidence-based digital technologies. This support facilitates the exchange of knowledge, reduces fears and insecurities that may arise during this delicate time and contributes to autonomy in the lactation process.⁸

In this sense, digital technologies contribute in different assistive contexts in maternal-child care by providing training for health professionals and adequate information for lactating women. These technologies have proven to be innovative tools, playing a fundamental role in supporting mothers during breastfeeding.⁹

Considering that women need guidance and support in the breastfeeding process, the objective of this study was to understand women's perceptions in the breastfeeding process during the COVID-19 pandemic, with a view to identifying subsidies for the development of a digital technology.

Methodology

This is a descriptive study with a qualitative approach, supported by Pressman and Maxim's framework on the development of digital technologies.¹⁰ According to the prototyping model, the process involved three stages: communication, rapid planning and rapid project modeling. This article will present the construction of the content of an educational digital technology – an application – aimed at supporting women on breastfeeding in the context of COVID-19. The present investigation followed the Consolidated Criteria for Reporting Qualitative Research Guidelines.¹¹

The research was developed at the Center for Medical Specialties, in the municipality of Macaé, state of Rio de Janeiro, Brazil, during the transition from the end of the COVID-19 pandemic to the post-pandemic period. Data was collected between March and November 2023. The end of the pandemic was considered to be May 2023, through the statement presented by the WHO 3 years and 3 months after the adoption of the global emergency, which occurred in January 2020.¹²

The study involved 36 women (12 pregnant, 12 puerperal and 12 nursing and lactating) in the breastfeeding process who attended prenatal, postpartum and child care consultations at the Center for Medical Specialties. The adopted inclusion criteria were: women (pregnant women, puerperal women and nursing mothers) aged 18 years or older, regardless of parity, with the intention to breastfeed, or who were in the breastfeeding process. The adopted exclusion criteria were: puerperal women or nursing mothers who were not breastfeeding due to clinical conditions.

In the context of participatory interviews¹³ with the included women, it was necessary to train the teams involved in carrying out the activity. This stage included faculty members, doctoral candidates, master's students and undergraduate students from the Research Group "Nursing in the Health of Newborns and Their Families". As a condition for participation, the presentation of the vaccination card with the doses of the COVID-19 vaccine was required.

In addition, meetings were held to develop materials containing the stages of the participatory interview, including: general and specific objectives, the creation of a banner for dissemination with information about the pre-established date and time between researchers and health professionals of the service, as well as the choice of a location with minimal noise and third-party interference, in such a way as to ensure the privacy of the women and the time for the interviews. Finally, a pilot study was conducted with 25 women (13 pregnant women, 5 puerperal women and 7 nursing mothers) for adjustments to the script. It is noteworthy that they were not included in the study.

Data collection was conducted through convenience sampling. The interviews followed the recommendation of a maximum number of 12 participants per group.¹⁴

Each day, up to three women were interviewed. All those who voluntarily accepted by signing the Free and Informed Consent Form (FICF) participated in this study.

In total, 36 interviews were conducted to include all participants, ensuring that each group (pregnant women, postpartum women and nursing mothers) consisted of three women, taking into account the waiting time before or after the consultations (Table 1).

Table 1 – Distributions of participant groups by interview

Group	Interview days	Participants per day	Approximate total of participants
Pregnant women	4 days	3 per day	12
Puerperal women	4 days	3 per day	12
Lactating women	4 days	3 per day	12

Each group had an average time of 30 to 40 minutes per interview, totaling approximately 6 to 8 hours of activities over the 12 days of interviews. In the first block, the research team was presented, the topic was introduced and the objectives and structure of the group were explained. After fulfilling the ethical aspects, permission was requested for audio recording of the participants' speeches. In the second block, the reading of the guiding questions was carried out: as pregnant women, what are your experiences regarding the breastfeeding process during COVID-19? What changes have occurred in your life regarding breastfeeding after the implementation of sanitary measures during pregnancy/childbirth/puerperium in the COVID-19 period? What would you like to see in an application about breastfeeding and COVID-19? For puerperal women and nursing mothers, the following question was added: what were the difficulties and facilitations for breastfeeding during COVID-19?

The third block included a synthesis of the main aspects that emerged from the reflection produced by the group. At the end of each participatory interview, the women were asked to formulate questions to support the development of an application that would provide the necessary information for the support, promotion

and protection of breastfeeding during the pandemic period, corresponding to the communication stage.¹⁰ To this end, each participant was provided with an A4 sheet of sulphite paper and colored pencils for making drawings.

Next, the interviews were concluded by requesting the participants' evaluation of the meetings and thanking them for their participation. The research assistant was responsible for recording, photographing and summarizing the key points of the women's speeches.

All statements were transcribed and analyzed by the researchers, who met periodically to discuss and reach consensus on the analyses. For data analysis, Thematic Content Analysis was used, following these stages: categorization, inference, description and interpretation.¹⁵

Initially, the material was read, which was decomposed into parts, using the theme as units of record and context (elements obtained from the decomposition of the text).¹⁵ These parts were allocated to the categories created initially based on the guiding questions script.

The excerpts (themes) from the transcribed testimonies were grouped into the same category when they presented similarities to each other. Subsequently, these categories, along with the extracted excerpts, were exported to Microsoft Word®, and the description of the obtained data was carried out. Finally, the interpretation of the results was conducted, using the theoretical framework¹⁰, especially regarding the communication and rapid planning stages, which are essential for the development of the digital technology.

In this context, the participatory interview represents the communication stage,¹⁰ being an essential moment for the exchange of information, gathering of requirements and alignment between those involved in the development of the technology.

In order to maintain anonymity, the interviewees were identified by the letter "P" followed by a numeral indicating the order of the interviews: P1, P2, P3, P4 (...) P36. The research participants were informed about the purposes, the applied methodology, the right to free access to the data and the possibility of withdrawing from participation at any time. Their consent and agreement to the research occurred through the signing of the FICF.

At the time of the participatory interview, all safety protocols against COVID-19 were respected, highlighting the commitment to the diligent adherence to the directives of the competent public authorities and the current health protocols, as well as careful monitoring of the pandemic scenario and its statistical and scientific data.

This study was submitted to the Research Ethics Committee of the Multidisciplinary Center of the Federal University of Rio de Janeiro (UFRJ, as per its Portuguese acronym), located in Macaé, where the research was conducted, and was approved on December 14, 2022, with Opinion nº 5.816.560, respecting the ethical issues of Resolution nº 466, dated 2012, which regulates the guidelines and norms for research involving human beings.

Results

Among the 36 women in the breastfeeding process, ages ranged from 18 to 44 years. Among them, 64.7% had completed secondary education and 61.7% were single. The majority received government assistance and 91.1% reported having internet access. The organized and analyzed data resulted in three themes: Maternal perception of knowledge about COVID-19 and breastfeeding; Experiences and feelings about the uncertainty of the COVID-19 situation and prevention measures and vaccination; and Participation in the process of developing a digital technology aimed at supporting breastfeeding during the pandemic.

Maternal perception of knowledge about COVID-19 and breastfeeding

The first category highlighted the women's lack of knowledge and insecurities about breastfeeding during the COVID-19 pandemic. The testimonies reveal fears about the transmission of the virus through breast milk, as well as doubts about the safety of the breastfeeding practice.

[...] Is there anything about COVID-19 that could interfere with breastfeeding? [...] (P1)
[...] If I have COVID and breastfeed, can she (my child) get it? Because they say that everything goes into the milk, right? [...] (P32)
[...] Is there any natural protection in breast milk against COVID-19? (P34) [...] What precautions should I take during breastfeeding if I suspect or have confirmation of COVID-19? (P31)

Vertical transmission through breast milk was a controversial issue during the COVID-19 pandemic. Many of the difficulties regarding information and guidance from

health professionals in maternal-child services may reflect on the support actions for breastfeeding and the safety of children's nutrition and feeding.

Experiences and feelings about the uncertainty of the COVID-19 situation and prevention measures and vaccination

The second category brings together the women's reports with their perceptions about the adopted preventive measures, as well as the challenges faced due to instability and changes in the guidelines about the disease.

[...] We see so many people, they say so many things, and we end up getting confused, one says one thing, another says another, the internet spreads one thing, but then you see it's fake, there's a lot of things, you know? [...] (P32)

[...] Although the virus may have decreased, right? But it hasn't ended, today I would feel a little more relieved [...] if we are protected, we are not, right? (P22)

[...] You have to keep taking care of yourself, wearing a mask, using alcohol gel, because COVID-19 isn't over either, is it?

[...] (P33)

[...] I hear some mothers saying: "oh that's nonsense, it's already over, it's done, and it's already passed." Is it over? It's over, but that's not the case [...] (P34)

[...] I have no knowledge of COVID-19 and what it can cause, what can happen to the child, even during pregnancy? [...] (P20)

Women face feelings that oscillate between worry and fear, as well as isolation, where they had to adapt to strategies that ensured their protection, dealing with social barriers, distress and feelings of helplessness.

[...] I was afraid of people close to me who also got it. Oh, my fear is constant [...] (P26)

[...] It was a very hard experience, but the isolation was better for him, because he was getting sick, since it helped at that moment and I knew it was for the best; it was more complicated, I wanted to breastfeed and I managed to do it for almost two years [...] I barely left the home and I didn't receive visitors. It was heavier because I had no one to rely on, all alone. (P10)

I didn't receive visitors; the first people my son went to see besides those at home were when he was 8 months old or older. Something that made me cry almost every day. It was very hard because I wanted to see my family, I wanted to see my nephews who had also been born [...] (P12)

The participants reported difficulty in adapting to certain preventive measures and some precautions to avoid transmitting the virus to the baby. Others, in turn, remained cautious and chose to adopt hygiene practices as a lifestyle, due to the benefits of this habit.

I haven't been wearing a mask for a while; I think we're even more hygienic now. Because now I don't worry about washing my hands or using alcohol gel, since that's already become a habit. (P1)

So, you will have a bit of a change because hygiene will be stricter, right? You'll have to pay more attention to people with colds around you, be more careful with your

mask when you're with a baby and always sanitize your hands, which is essential even without COVID-19 [...] (P4)

[...] You have to wash your hands for everything, apply alcohol, and always change your bra, because of bacteria. On the day I was going to give birth to him, I had to wear a mask, had to wash my hands before holding the baby, had to change the mask to breastfeed. Even to put him on my chest, I had to wash my hands [...] (P25)

Regarding the COVID-19 vaccination, participants expressed their doubts about how it works and possible risks, so that they could finally make their decision.

I would like to know when I can vaccinate my child with the COVID-19 vaccine. I have questions about the vaccine for babies and whether there are reactions or side effects. (P5)

What is the importance of COVID-19 vaccination in pregnant and lactating women? (P28)

How is the vaccination of newborns against COVID-19? (P31)

The negative influence of various sources of information, the impact of social distancing and the lack of support networks for breastfeeding women during the COVID-19 pandemic were identified.

Participation in the process of developing a digital technology aimed at supporting breastfeeding during the pandemic. The content of the application prototyping was selected based on the participation of 36 women, highlighting the information required for the construction of this application, as shown in Chart 1.

Chart 1 – Communication requirements¹⁰ for the rapid planning stage of the application. Macaé - RJ, 2024

Categories pre-defined by women	Themes for the screens
Knowledge about COVID-19 and breastfeeding	Transmission of the new coronavirus and human milk: myths and truths. Does COVID-19 harm newborns' health?
Expression of feelings	Mental health for women in the breastfeeding process (pregnant women, puerperal women and lactating women): where to seek help?
Prevention measures and vaccination against COVID-19	How many types of vaccines for COVID-19 are there? What are the types of vaccines? Difference of the vaccine for pregnant women and lactating women. Do newborns need to be vaccinated against COVID-19? Effects of the COVID-19 vaccine for pregnant women, lactating women and children.

Source: Communication requirements for the development of the application according to the participants' testimonies, considering their experiences and doubts regarding the addressed theme¹⁰

Discussion

Based on the testimonies of the interviewed women, it was observed that there is still a lack of knowledge about the transmission of the virus through breast milk. The participants reported doubts regarding safe practices and the possible risks posed by the new coronavirus during breastfeeding, as well as the fear of transmitting the virus to their babies. In the literature, there are no contraindications for breastfeeding during COVID-19, but it is essential to adopt some protective measures, such as washing hands with soap and water, keeping vaccinations updated and wearing masks.¹⁶

The benefits of breastfeeding are crucial for both the mother and the baby. During the pandemic, scientific evidence already indicated that newborns born to mothers with COVID-19 were colonized with the virus, due to previous exposure to it during pregnancy.¹⁷

Although some studies indicate the presence of the virus in human milk, the possibility of sample contamination cannot be ruled out. Even if the virus is identified, it does not replicate or reproduce as occurs in other viral diseases.¹⁸⁻¹⁹ A study that analyzed 187 women with SARS-CoV-2 infection during pregnancy or childbirth recruited in maternity hospitals in Spain and Hong Kong confirmed the absence of the virus in the analyzed samples.¹⁹

In the breast milk of mothers infected with COVID-19, the presence of antibodies that neutralize variants of SARS-CoV-2 has been evidenced, with immunoglobulin A being the most abundant, acting to protect the baby against infection, as well as IgM and IgG antibodies. Therefore, breastfeeding can be considered safe and recommended, as long as the mother's condition is favorable and the appropriate precautions are taken.¹⁸⁻²¹

Another study showed that 64.6% did not know that mothers who tested positive for COVID-19 should start/continue breastfeeding; therefore, the lack of guidance and the fear of harming their children encourage the interruption of breastfeeding.²²

The women taking part in this research reported feelings marked by oscillations between worry and fear, as shown in their testimonies during the interviews. Social isolation also contributed to them seeking protection strategies, aimed at their safety in the face of the situation they experienced, confronting social barriers, feelings of distress and helplessness.

Throughout pregnancy and the puerperal period, women experienced fear and loneliness due to social restrictions, where they could not rely on a support network. It is noteworthy that pregnant women, lactating women and puerperal women are more vulnerable due to hormonal changes limited to pregnancy and the postpartum period, which can make them more sensitive to symptoms related to depression and anxiety.²³

More specifically, the fear of coronavirus infection ranked among the main factors of hesitation in seeking care by the general population, creating a barrier in the follow-up and the bond established in health care, especially in the case of pregnant women, breastfeeding women and puerperal women. An analysis indicated that perceiving COVID-19 as a serious threat and having higher fear scores resulted in an increased adoption of protective measures.²⁴

A cross-sectional study conducted in Albania evaluated that some factors, such as social isolation, concerns related to the threat of COVID-19 on maternal-child health, socioeconomic conditions and parity, influence the emergence of symptoms related to anxiety and depression.²⁵ These results corroborate with a community-based study conducted in India, where participants also faced depressive symptoms, as well as financial and health concerns, as a result of the pandemic.²⁶

An analysis of the impact of the home confinement caused by the COVID-19 pandemic indicated that, compared to the initial period of the pandemic, many mothers were close to physical and emotional exhaustion, due to the accumulation of continuous tasks and the lack of emotional support, resulting from the ongoing workload and the absence of social and family support. These factors resulted in negative impacts on the participants' mental health, with reports of suffering and psychological helplessness.²⁷

Health professionals need to be alert to the early identification of possible psychological changes, providing adequate support to the identified demands through active listening and the creation of a therapeutic bond, enabling comprehensive care and avoiding the neglect of mental health issues that may arise as a result of COVID-19.²⁸

Therefore, in light of the pandemic situation of COVID-19, health professionals, especially nurses, need to devise strategies to ensure support and protection for breastfeeding, in addition to preserving the bond between mother and child. Regarding protective measures, such as the use of masks, some participants reported that, despite

the discomfort and annoyance of wearing them during breastfeeding, they no longer considered this practice necessary. Regarding the practice of hand hygiene and the use of alcohol gel, they reported that these are habits that remain in their daily lives. Guidance on good practices should be initiated early, starting from pregnancy, and disseminated within health units in order to improve housing conditions, water quality, basic sanitation and psychosocial care, as well as care related to COVID-19, reinforcing measures to prevent infections in the context of the health emergency.²⁹

In health services, it is necessary to reinforce empowerment and the sense of self-efficacy in health care, with a view to preventing the COVID-19 virus. This can be carried out through health education, emphasizing care related to the virus, the availability of professional resources and the dissemination of evidence-based information.²⁹

Encouraging health education and vaccination campaigns targeted at these women is an essential strategy to be prioritized in order to keep vaccinations updated and to help them to recognize the importance of prevention.³⁰

In the future, this work will contribute to the development of a mobile application on breastfeeding and COVID-19, addressing the main issues that create insecurity and misinformation among women in the pregnancy-puerperal cycle, especially regarding the transmission of the virus through breast milk and vaccination. Thus, it aims to advance the science of nursing and related areas, reinforcing the promotion, protection and support of breastfeeding in the post-pandemic period.

As a limitation of this study, it is highlighted that the sample was restricted to a single health unit, which does not reflect the entirety of users in the municipality of Macaé. Nonetheless, the study provided support for the construction of a technology that can assist breastfeeding during the COVID-19 pandemic and help to address the gaps in knowledge about the theme.

Conclusion

The women's testimonies were fundamental for constructing knowledge about experiences, doubts and needs during the pandemic, especially regarding breastfeeding. The shared information allowed for the identification of relevant aspects that should be considered in the development of digital technologies aimed at this audience. Thus, the

participation of the interviewees was essential for the organization of a future application targeted at lactating mothers.

The findings of this study highlight the importance of understanding women's perceptions in the breastfeeding process during the COVID-19 pandemic, emphasizing the challenges faced by them and the emerging demands in this context. The women's testimonies reinforce the need for strategies that increase access to qualified information and professional support. In this sense, the development of digital technologies aimed at supporting, promoting and protecting breastfeeding can be presented as a fundamental tool in terms of strengthening health education and disseminating evidence-based information, thus contributing to more accessible and effective care.

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