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Implications of the COVID-19 pandemic on breastfeeding and health promotion: perceptions of breastfeeding women

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Abstract *This article aims to understand the implications of the COVID-19 pandemic on breastfeeding and health promotion actions within primary care from the perception of breastfeeding women. This qualitative study was developed with 24 women who breastfed during the first year of the pandemic. Data were analyzed using Content Analysis and interpreted in the light of the Interactive Breastfeeding Theory (IBT). The pandemic affected the vulnerability of the mental health of breastfeeding women, entailed difficulties for the continuity of breastfeeding and early insertion of formulas, impacted COVID-19 preventive measures in breastfeeding, and produced changes in the work of breastfeeding women. Furthermore, areas for improvement were identified in health promotion actions and the mother-child binomial support due to the interruption of childcare visits. Actions to promote child health in primary care were unsatisfactory. However, most study participants maintained exclusive breastfeeding for the first six months, which could adversely affect child morbimortality.*

Key words *Breastfeeding, Health Promotion, Primary Care, Women, COVID-19 pandemic*

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Introduction

According to the Ottawa Charter[1], Health Promotion (HP) empowers the community to improve the quality of life and health, encouraging active participation in controlling this process.

In Brazil, it is possible to develop skills and empower people and communities to act actively toward improving the quality of life[2]. To this end, the health team must be based on interdisciplinary practice, valuing local potential and intersectoral partnerships to provide comprehensive care and strengthen social participation[2].

In the last three years, HP practices within Primary Health Care (PHC), especially those focused on women's health, were impaired due to the COVID-19 pandemic, which changed the provision of care to this population, causing difficulties and problems regarding healthcare[3].

The need for social distancing imposed by the COVID-19 pandemic also hampered access to reproductive health programs, with interruptions and changes in the care model in prenatal, childbirth, and postpartum care services[4]. Moreover, women struggle to contact their primary (family, friends) and secondary support (professionals, health, and social assistance services), besides addressing an overload of news and information regarding the growing number of confirmed cases and deaths caused by the coronavirus[5].

Given this setting, a practice that may also have been affected by the pandemic was breastfeeding (BF). Scientific evidence shows that the lack of professional support for breastfeeding women due to the pandemic interrupted breastfeeding globally[6]. Data from a study in the United Kingdom[7] showed that the most frequent reasons for interrupting BF in the pandemic are the lack of face-to-face professional support and women deciding to stop breastfeeding due to its insecurity, with a risk of transmitting the virus to their babies.

According to the Ministry of Health[8], even puerperae suspected or positive for COVID-19 should continue breastfeeding their babies. Thus, PHC health teams should accompany these women in the puerperium, guiding them in safe breastfeeding under established protocols.

Besides the above, the postpartum follow-up by remote appointments faced technical and logistical difficulties, hindering a greater bond and reading the body language of the puerperae[9].

Given this context, the present study aimed to understand the implications of the COVID-19 pandemic in breastfeeding and health promotion actions within primary care based on the perception of breastfeeding women.

Methodological procedures

This qualitative, descriptive, and exploratory study was developed according to the Consolidated Criteria for Reporting Qualitative Research (COREQ) precepts and based on the theoretical framework of the Interactive Theory of Breastfeeding (ITB), which concerns the aspects inherent to breastfeeding[10].

The ITB is a mid-range theory of nursing based on the components of the Conceptual Model of Interactive Open Systems by Imogene King. It emphasizes that systems are open, intercommunicating, and seek individual and group balance, where any change in one of the systems can have repercussions on the others. Thus, individuals are intended to preserve their health with their dynamic needs based on personal, interpersonal, and social interactive systems relating continuously to the environment. Among the concepts intertwined with such systems in the ITB, breastfeeding is seen as an interactive process between women, their children, and the environment[11].

The Interactive Theory of Breastfeeding describes, explains, and analyzes factors that influence breastfeeding initiation, maintenance, and termination. The theory provides elements that can predict the result and the dynamic and systematic interactivity of breastfeeding. It proposes eleven theoretical concepts: dynamic mother-child interaction; women's biological conditions; children's biological condition; women's perception; children's perception; woman's body image; breastfeeding space; mother's role; organizational systems to protect, promote and support breastfeeding; family and social authority; and women's decision -making[10].

The study included 24 women linked to the assigned areas of three Family Health Units (USF) of Health District (DS) III of Recife, Pernambuco, purposely chosen. Breastfeeding mothers who had children from April 1 to September 30, 2020, and breastfed during the first year of the COVID-19 pandemic were selected. Those with compromised mental health during the data collection phase were excluded. The delimitation of this period was due to some routine care demands, such as childcare visits, which had restrictions due to the need to restructure the municipal health network[12].

In the data collection process, together with the DS-III family health teams, children born in the first year of the pandemic, between the pre -established months, were identified. Then, the respective mothers' profiles were mapped with the team's professionals and complemented du-

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ring the interview. Breastfeeding women were characterized by age group, the existence of a partner, employment type, whether they contracted COVID-19 during pregnancy, delivery, or postpartum, number of children, delivery type, and number of prenatal care visits.

Many activities have become remote for preventive reasons due to the pandemic setting, including a good part of scientific research actions[13]. Thus, data were collected from December 2021 to January 2022 through digital media audio-recorded interviews, via the multiplatform instant messaging application WhatsApp, with a mean duration of 35 minutes, and subsequent data transcription. The interviews were held through a semi-structured roadmap, with the following guiding questions: "Tell me about your experience with breastfeeding in this pandemic setting"; "In your perception, what factors facilitated your BF in this period, and what are the difficulties faced in BF?"; "Did you receive help from the USF health team after you arrived from the maternity ward?".

Data production ended due to theoretical saturation when the corpus had thematic recurrences and achieved the proposed objective[14].

The interviews were analyzed using Bardin's content analysis technique[15]. An initial reading of the material was performed in the organization or pre-analysis stage, and the documents useful for the research were separated and the initial hypotheses formulated. Then, the obtained content was submitted to a detailed study to identify new record units, which were grouped into codes or thematic categories to respond to this study's objectives. In the third phase of categorization, these nominal categories were organized to interpret the emerging results and search for the meaning of the messages. This is the time for intuition and reflective and critical analysis[15].

This study respected the ethical requirements under Resolution No. 466/2012, and all participants read and signed the Informed Consent Form. The interviews were randomly coded from P1 to P24.

Results

Twenty-four nursing mothers participated in the study. Most were aged 26 to 30, married, and had two or more children. Regarding the type of employment relationship, most were self-employed or worked from home.

Most women reported that the prenatal care visits were conducted satisfactorily despite the pandemic context, vaginal delivery prevailed, and most breastfeeding women adopted exclusive breastfeeding (EBF) for six months. Most respondents reported not being infected by COVID-19 during the pregnancy-puerperal period, and less than half had confirmed results through diagnostic tests.

Two thematic axes were prepared from the analysis of the empirical material: Repercussions of the pandemic on the promotion of breastfeeding; Weaknesses in health promotion and support for the mother-child binomial in primary care during the COVID-19 pandemic. The statements of the nursing mothers were presented in tables on each axis, with dialogue between them and the theoretical ITB concepts.

Axis 1 - Repercussions of the pandemic on the promotion of breastfeeding

The COVID-19 pandemic represented a moment of fear and insecurity during the pregnancy -puerperal period for breastfeeding women. Breastfeeding was permeated by different feelings, such as concern and anxiety regarding the possibility of transmitting COVID-19 to their babies. However, despite uncertainties, mothers showed knowledge of health protocols. They aimed to implement precautionary recommendations against the coronavirus: hand hygiene, mask use during breastfeeding, social distancing, and restricted visits to the mother-child binomial.

Due to this setting, some changes also occurred in women's work. The home office work activity adopted by employers and self-employment allowed many breastfeeding women to breastfeed longer, which promoted breastfeeding during the pandemic. However, other women were fired from work during pregnancy or shortly after the end of maternity leave, which may have compromised their mental health and, consequently, adherence to BF or its continuity.

Another repercussion of the pandemic in promoting EBF up to six months was the early inclusion of infant formulas to complement or even replace breast milk due to the return to work, low milk production, cracks in the breasts, cultural and family influence, and women's decision.

It is noteworthy that, even in the face of the difficulties and implications of the pandemic in the breastfeeding process and the peculiarities of the puerperal period, most breast-nursing mothers did not give up breastfeeding. The search for information and the desire to breastfeed were predominant for them to secure breast milk on demand, as per the data in Chart 1.

Axis 2 - Weaknesses in health promotion and support for the mother-child binomial in primary care during the COVID-19 pandemic

Breastfeeding is not exclusive to women but is influenced by the entire primary and secondary support network surrounding them. In this study, in the face of a pandemic setting, we observed that the most engaged support network for women comprised of family members. Health services did not provide enough guidance on the breastfeeding process, and PHC professionals did not perform home visits in the first postpartum week.

The online strategy of monitoring the breastfeeding mother and her child was adopted to mitigate the losses in breastfeeding and child monitoring arising from the lack of visits and face-to-face home visits. It adopted text messages and telephone calls. The findings indicate that this strategy included only some women and children. Moreover, children's follow-up through childcare visits in primary care was also compromised as it started late and needed to be complying with the recommendations of the Ministry of Health. The low USF attendance resulted in poor child development follow-up in the first months of life, as shown in Chart 2.

Discussion

Caring for women in the pregnancy-puerperal cycle during the COVID-19 pandemic is challenging. It demands decisive action from health professionals in creating strategies that contribute to adequate and safe care during this period[16].

The accounts of the women in this study reveal that mothers are concerned and insecure about transmitting the SARS-CoV-2 virus during breastfeeding. However, the virus' presence in the breast milk of women positive for COVID-19[17] has not been proven. The insufficient knowledge about the coronavirus transmission through breast milk can influence the Interactive Theory of Breastfeeding concepts in women's decision -making to continue breastfeeding, causing stress and interfering with the breastfeeding duration[10]. Furthermore, reported misinformation may be related to the failure of organizational systems to protect, promote, and support breastfeeding, and not only during motherhood[10].

Amidst the uncertainties, the fears generated during the pandemic made responsible bodies change breastfeeding care. However, it remained vigorously defended by the World Health Organization (WHO). According to Technical Note No. 10/2020, skin-to-skin contact (SSC) and breastfeeding can occur after performing hygiene care and adopting measures to prevent newborn contamination, such as cleaning the parturient (bath in the bed), and mask, cap, nightgown, and sheet change[18,19].

Considering that women's environment is of great importance for better child development and the promotion of the mother-child bond, fear, and psychosocial disorders affected this construction, generating negative repercussions on the health of both. Furthermore, the COVID-19 pandemic produced stress and anxiety in pregnant women globally[20].

In this context, health professionals can adopt interrelated ITB concepts that influence the breastfeeding process. Women's decision-making is a dynamic behavioral process in which they choose to breastfeed, among other options offered, since they see themselves as a mother and family authority in society. However, these women's stance weakened in the pandemic, limiting the follow-up of care to puerperae, causing conflict in the mother-child interaction[10].

We can also observe the weak relationship between family, community, and the State when identifying that women are often forced to work outside the home ahead of time due to financial necessity and, while included in the labor market, they remain with daily household responsibilities, no longer exclusively breastfeeding their children[21].

With the COVID-19 pandemic, the type of work known as home office (or remote work) was established to reduce employees' exposure to highly contaminated environments[22]. With that, many women could continue their work and offer EBF until six months.

At home, a support network formed by the partner, the child's grandmother, or other family members was a predictor of improved breastfeeding outcomes[23].

On the other hand, not all women could work remotely and have a support network during the pandemic. They adopted infant formula in baby food. Therefore, these results show an articulation between the concepts of women's and children's perceptions, biological conditions of women and children, space for breastfeeding, and family and social authority. The latter brings in its definition the importance of valuing the concepts and perceptions of each member active in

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Chart 1. Presentation of Axis 1, Sub-axes, Interactive Breastfeeding Theory (IBT) concepts, and breastfeeding women discourses related to the repercussions of the pandemic on the promotion of breastfeeding.

Axis 1 - Repercussions of the pandemic on the promotion of breastfeeding		
Sub-axes	**IBT concepts**	**Discourses of breastfeeding women**
Vulnerability of the mental health of breastfeeding women during the pandemic	- Women's biological conditions - Women's perception - Woman's body image - Decision-making - Organizational systems to protect, promote, and support breastfeeding - Mother-child interaction (Stress and breastfeeding time)	"The pandemic made me very afraid of everything. I was even afraid of giving the breast and breastfeeding, because I feared having caught something at the hospital and transmitting it to my girl" (P6). "[...] COVID brought me more psychological discomfort. I was very anxious, worried about passing it on to them. I was right next to them wearing a mask, the whole time. I was in that huge concern [...]" (P15). "[...] I spent several sleepless nights, crying, me without milk. I couldn't take it. I didn't go back to "normal" after everything I've lived. I still don't sleep all night. He still doesn't sleep all night. I cry a lot" (P21).
Adoption of preventive measures against COVID-19 during breastfeeding	- Decision-making - Organizational systems to protect, promote, and support breastfeeding - Dynamic mother-child interaction (Stress and breastfeeding time)	"[...] the challenges of this period were more related to hand hygiene care and constant use of a mask. It was a routine unlike anything else [...]. That was like learning" (P9). "At first, it was a little strange, because whenever I was going to breastfeed, I preferred to wear a mask. I didn't leave the house in the first months due to the protection and the pandemic" (P19).
Impact of the pandemic on women's work and its consequences on breastfeeding	- Women's decision-making - Women's perception - Breastfeeding space - Mother's role - Organizational systems to protect, promote, and support breastfeeding - Family and social authority - Dynamic mother-child interaction (Stress and breastfeeding time)	"The pandemic brought me a benefit, which was being able to work at home and follow my daughter's growth for up to 1 year. If it weren't for the pandemic, I would go back to working outside the home when she was 6 months old" (P16). "I am self-employed and I didn't stop during the pandemic; even so, I continued to breastfeed, and my baby breastfeeds until today" (P3). "When I came back from my leave, they gave me a vacation and then fired me. This was in February last year (2020). So, I haven't found any more permanent jobs since then" (P9).
Difficulties for the continuity of breastfeeding during the pandemic and introduction of infant formulas	- Women's biological conditions - Children's biological conditions - Women's perception - Children's perception - Women's decision-making - Mother's role - Family and social authority - Organizational systems to protect, promote, and support breastfeeding	"[...] I 'opted' to give the formula to my daughter, because I only saw her crying with hunger, and I couldn't give her food because my breasts wouldn't fill up [...] that's when I researched better and saw there were other milk options for me to give. So, I chose the formula and she had it up to 5 months" (P1). "My breasts were all sore, very sore, heavy, and very hard [...] I spent almost two months trying to breastfeed like this, but he cried a lot, and people around me said he was hungry. Then, I had to resort to the formula [...] My breasts got red, hot, cracked, with outpouring blood and secretion" (P8).
Importance of health education in promoting breastfeeding in the pandemic	- Women's biological conditions - Children's biological conditions - Women's perception - Women's decision-making - Mother's role - Organizational systems to protect, promote, and support breastfeeding	"I studied a lot, I read a lot before giving birth, especially in the last few weeks [...] You can have access to information, which many people don't have. This is the most necessary thing, especially for a first-time mother [...] I had excellent breastfeeding" (P12). "I had no problems with breastfeeding. I'm a first-time mother and breastfeeding hurts, but it was very magical. I researched about it, and it was our connection, our moments, I breastfed on demand. He was just stuck on me" (P16).

Source: Authors.

the breastfeeding process as a guide for the woman's behavior[10].

Understanding the concept of breastfeeding space from the ITB perspective, its influence on breastfeeding, and its dependence on relationships and situations imposed by the personal, historical, and sociocultural context of women[10,24] is considered. Thus, while some mothers could breastfeed longer, others felt forced to stop before they were ready due to a lack of professional guidance, as some hospitals discharged mothers and their newborns early and limited visits and appointments, reducing specialized lactation care time, education, and technical assistance[7,25].

Restricted physical contact due to social distancing due to the pandemic, and the limited support by health services in PHC, also allowed and stimulated the search for other solutions to emerging hardships. Thus, due to different digital marketing strategies, different proposals for infant formulas emerged to replace or complement breast milk[26].

Among the reasons for early weaning is nipple trauma, which could be noticed and avoided by the health team if a greater follow-up in promoting BF during prenatal and puerperium care was in place. Knowing the benefits of breastfeeding can encourage its practice, even in the face

Chart 2. Presentation of Axis 2, Sub-axes, Interactive Breastfeeding Theory (IBT) concepts, and breastfeeding women discourses related to weaknesses in health promotion and support for the mother-child binomial in primary care during the COVID-19 pandemic.

Axis 2 - Weaknesses in health promotion and support for the mother-child binomial in primary care during the COVID-19 pandemic		
Sub-axes	**IBT concepts**	**Discourses of breastfeeding women**
Primary support network for breastfeeding women in the puerperal period during the pandemic formed by the family	- Family and social authority - Breastfeeding space - Decision-making - Organizational systems to protect, promote, and support breastfeeding - Mother's role	"My husband and my family helped me at home. When he had to work, my family supported me" (P4). "My husband helped me a lot. He helped me all the time, until my protective measure was over" (P19). "My support came from my mother and grandmother. They were always with me" (P18).
Insufficient support from primary care to puerperal women to promote breastfeeding in the pandemic	- Women's perception - Breastfeeding space - Decision-making - Organizational systems to protect, promote, and support breastfeeding - Mother's role - Mother-child interaction	"When I returned home, the first few days were very difficult, I couldn't stand the pain to breastfeed [...] and I didn't receive any visits from anyone at the unit. Now, it was because of the pandemic" (P6). "I really wanted to be able to breastfeed, but it was hard. I think if I had had more support, if I had received more close guidance, as it was before, normal before the pandemic..." (P1).
Strategy for remote monitoring of the mother-child binomial by the health team during the pandemic	- Women's biological conditions - Children's biological conditions - Women's perception - Breastfeeding space - Women's decision-making - Mother's role -Organizational systems to protect, promote, and support breastfeeding - Dynamic mother-child interaction (Stress and breastfeeding time)	"The health worker sent a message to find out how we were doing [...] she always encouraged us to continue breastfeeding" (P6). "I didn't have much support from the unit. No one looked for me at my home or sent a message. They helped me only when I needed it, and I went there" (P3). "After giving birth, I still had two appointments online. Then, I started going to the health center [...]. It took a while, due to the pandemic rules, but it did" (P4). "So, as soon as my baby was born, I wasn't having appointments. And he still spent about four months without having an appointment [...] because of the pandemic restrictions" (P3).

Source: Authors.

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of difficulties, and this emphasizes the importance of the health team in the prenatal, postpartum, and childcare follow-up[27].

The ITB addresses the dynamic mother-child-environment interaction as a condition for achieving satisfactory breastfeeding. Thus, the health team can use the theoretical concepts to guide healthcare, identifying the weaknesses in this interaction to collaborate with promoting breastfeeding continuity[10].

It is worth noting that an adequate support network is essential for this practice, especially in the first days of breastfeeding, after childbirth. However, this family and health team support for women was reduced[28] with social distancing. Even in the face of difficulties, we should recognize the most influential individuals in the nursing mother's social network and understand the dynamic interaction of these people with women in the breastfeeding process[10].

The statements of breastfeeding women pointed out that the leading primary support network during the pandemic was limited to family members, and husbands and their mothers were more frequent. This result is corroborated by research conducted with Hispanic women residing in the United States, which indicated that 57% mentioned the partner as the primary support and 32% the mother[29].

The support of partners/husbands is essential to successful breastfeeding. Their presence with the mother and baby, help with household chores, and baby care can ease the hardships experienced in breastfeeding[30].

Another essential member of the support network for breastfeeding women is the PHC health team. It was necessary to reorganize the services and care provided to mitigate infection and better assist those already infected[26,31] during the COVID-19 pandemic, especially in the initial phase of coronavirus infections.

However, even with all the professionals' efforts, breastfeeding women and childcare assistance were impaired since there needed to be a specific resizing plan to preserve assistance and reduce harm to breastfeeding women. Research carried out by Fiocruz throughout Brazil[32] revealed that almost 50% of workers admitted to being overworked during this global health crisis, working more than 40 hours a week, besides professional staff shortage. As a result, the supply and quality of care for women were compromised during this period.

Promoting breastfeeding, when initiated during pregnancy and continued in the puerperal period, supports the prevalence of longer BF duration. In the meantime, we understand the need and relevance of puerperal visits by PHC professionals, respecting all protocols[5].

Given the pandemic setting, telemedicine emerges as a strategy for continuity of care for the mother-child binomial. The virtual puerperal visit aimed to facilitate the approximation between patients and health professionals due to the restrictive pandemic measures, although it did not replace the face-to-face appointment. Despite the limitations inherent to this care model, it is possible to conduct health promotion and prevention activities, favoring essential aspects such as neonatal screening, timely vaccination, and establishing BF[33].

Thus, it is essential to emphasize that telehealth assists women in the pregnancy-puerperal cycle. It has been a promising and sustainable tool, not only for the pandemic context. However, the present study revealed that this type of care was incipient, heterogeneous, and without standardized provision of services, mainly due to restricted access to the Internet by most of the Brazilian population[34].

We should also note how challenging childcare was for health professionals and mothers during the COVID-19 pandemic, given that social distancing and isolation hindered mothers' access to USFs, and mothers were encouraged to take care of the child at home, taking them to health services only in case of illness, which goes against health promotion guidelines[35].

Due to the restrictions expressed in current protocols[10,36], this study revealed the difficulty of immediate puerperal follow-up in the pandemic and the limitations for starting childcare visits at the USF in Recife, temporarily suspended, with priority given to at-risk children care.

Thus, the COVID-19 pandemic has side effects that extend beyond those of direct viral infection. Although the coronavirus does not cause severe direct effects on the child population, its indirect effects are relevant and still unknown[37].

Final considerations

The pandemic affected the quality of breastfeeding for women. However, although most women maintained exclusive breastfeeding in this study, this process altered the mental health of those who lived under tension, anguish, and anxiety about contracting SARS-CoV-2 during the critical moments of the pandemic in 2020 and 2021.

Regarding the emotional and affective mother-baby bond, social distancing has been expe-

rienced as a positive experience for preserving breastfeeding, as it promoted greater contact time between mothers who had the guaranteed right to remote work (home office) or even among self-employed women. On the other hand, the pandemic has contributed to unemployment, which can promote increased vulnerabilities and social inequalities.

The women's support network was weakened by concerns about infection during the first year of the pandemic, with the more effective participation of the primary support network, consisting of the husband and mother of the nursing mother. This support was aggravated due to the lack of specific guidelines for the PHC team as a secondary support network since this team had to prioritize care for people who are sick or symptomatic due to COVID-19.

It is noteworthy that the Interactive Theory of Breastfeeding was feasible to analyze the reality of the study participants, showing its potential for practice with breastfeeding women, considering that its concepts are consistent with what women experience. However, the negligible number of studies with data analyzed in the light of ITB could have improved the comparison of our results. Thus, further studies related to the theory and its components are recommended to confirm its value for promoting BF and making healthcare more scientific.

A limitation of this study is the low number of participants, which may not represent the reality of Brazilian women in breastfeeding and the recent nature of the application of the ITB, and new research in different social contexts is required to subsidize a more in-depth theoretical analysis on the impact of COVID-19 in the different Brazilian settings.

Collaborations

CF Silva worked on all stages of the manuscript. APS Reichert worked on the design, analysis, and interpretation of data and the article's critical review. WM Faustino and ASLG Leal worked on the conception and design of the research. ICS Bezerra and AR Soares worked on the analysis and interpretation of data and the article's drafting. All authors approved the final version.

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