REVIEW ARTICLE

Impact of COVID-19 on female reproductive health and communication post-pandemic: A scoping review

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Abstract

The COVID-19 pandemic significantly affected Female Reproductive Health (FRH), intensifying physiological and psychological conditions such as amenorrhea and postpartum related issues. While clinical studies have well-documented these impacts on FRH, no studies empirically tested health communication interventions, revealing a significant research gap. This scoping review bridges this gap, mapping evidence on the impact of COVID-19 on FRH and probing the untapped potential of communication strategies to mitigate these impacts. Following PRISMA-ScR guidelines, we systematically searched PubMed, PsycINFO, BMJ Global Health, and Frontiers (2021-2024) for peer-reviewed studies. The 13 included studies documented menstrual irregularities in 50-67% of women post-infection/vaccination, fertility rate declines of 18 per 100,000 women, and postpartum depression prevalence of 25.27%. Eligibility criteria included Women of reproductive age (15-49 years) affected by COVID-19's impact and implemented strategies addressing these impacts post-pandemic. We proposed integrating robust trauma-informed communication road map such as digital health literacy programs and community-led strategic initiatives. *(Afr J Reprod Health 2026; 30 [8]: 102-118).*

Keywords: COVID-19, Female Reproductive Health, Health Communication, Post-Pandemic recovery, Strategic Communication

Résumé

La pandémie de COVID-19 a fortement affecté la santé reproductive des femmes (SRF), aggravant des troubles physiologiques et psychologiques tels que l'aménorrhée et les problèmes liés au post-partum. Si les études cliniques ont bien documenté ces impacts sur la SRF, aucune étude n'a évalué empiriquement les interventions de communication en santé, révélant ainsi une lacune importante dans la recherche. Cette revue exploratoire vise à combler cette lacune en recensant les données probantes sur l'impact de la COVID-19 sur la SRF et en explorant le potentiel inexploité des stratégies de communication pour atténuer ces impacts. Conformément aux directives PRISMA-ScR, nous avons effectué une recherche systématique d'études évaluées par des pairs dans PubMed, PsycINFO, BMJ Global Health et Frontiers (2021-2024). Les 13 études incluses ont documenté des irrégularités menstruelles chez 50 à 67 % des femmes après l'infection ou la vaccination, une baisse du taux de fertilité de 18 pour 100 000 femmes et une prévalence de la dépression post-partum de 25,27 %. Les critères d'admissibilité incluaient les femmes en âge de procréer (15-49 ans) touchées par les répercussions de la COVID-19 et ayant mis en œuvre des stratégies pour y remédier après la pandémie. Nous avons proposé d'intégrer une feuille de route de communication robuste et adaptée aux traumatismes, notamment des programmes d'éducation à la santé numérique et des initiatives stratégiques communautaires.. *(Afr J Reprod Health 2026; 30 [8]: 102-118).*

Mots-clés: COVID-19, santé reproductive des femmes, communication en santé, reprise post-pandémique, communication stratégique

Introduction

The COVID-19 pandemic has had profound repercussions on various aspects of health, particularly on female reproductive health. The varied impacts may be categorized into pandemic-related physiological effects, psychological stressors. Physiologically, several studies have documented changes in menstrual cycles, reproductive hormone levels, and overall reproductive health in women during the pandemic. For instance, a cross-sectional study conducted in the Jazan province indicates significant alterations in menstrual cycles attributable to COVID-19, highlighting a considerable impact on women of reproductive age.[1] A systematic review by Lebar et. al. also revealed that approximately 50 to 60% of reproductive-age women experienced menstrual irregularities following COVID-19 vaccination, raising concerns regarding vaccine-related effects on

reproductive function.[2] Li et. al. in their studies also revealed the increased expression of Angiotensin-Converting Enzyme (ACE2) receptors in the female reproductive tract, which suggests a potential mechanism for COVID-19 to interfere directly with reproductive functions.[3] Collectively, these findings emphasize the direct physiological impacts of the pandemic on female reproductive health, necessitating a more focused approach to health communication.

Psychologically, the pandemic has exacerbated mental health issues among women, impacting their reproductive health indirectly. Research indicates that women reported higher anxiety and stress levels during the pandemic compared to their male counterparts.[7-8]

Phelan et. al. posits that the interplay between psychosocial stressors and reproductive health is significant; high stress levels are correlated with conditions such as premenstrual syndrome (PMS), reflecting the psychological burden manifested through reproductive health issues.[6] Other studies have documented a notable increase in the prevalence of mental health conditions among women during COVID-19, underscoring the need for targeted mental health support and communication strategies.[5] Zanardo et al. found that quarantine measures exacerbated emotional problems in postpartum mothers, indicating a strong relationship between pandemic stressors and the development of postpartum depression.[9] In a systematic review, Adrianto et al. revealed elevated levels of depression among pregnant and postpartum women, attributing this to fears related to COVID-19, economic instability, and lack of support.[10] Yan et al. also went further to identify a troubling increase in anxiety and depression in the perinatal population during COVID-19 compared to baseline estimates from prior to the pandemic.[11] This spike suggests that the pandemic's context has acted as a significant exacerbating factor in the incidence of postpartum depression —corroborating findings by Pinto and Figueiredo, noted an increase in both depressive symptoms and negative couple interactions during the pandemic.[12]

Furthermore, the pandemic indirectly affected women's reproductive health through disruptions in access to necessary healthcare services. Carp-Velișcu et al. found that many women, especially those seeking fertility treatments, faced interruptions in care due to the closure of clinics and reduced services, adversely affecting their mental and emotional well-being.[13] They also pointed out that the limitations on Assisted Reproductive Technologies (ART) during the pandemic diminished couples' optimism about fertility, particularly for older women facing challenges related to reproductive aging.[13] Likewise, some scholars who identified obstacles that constrained Reproductive, Maternal, Neonatal, Child, and Adolescent Health (RMNCAH) services during COVID-19, includes the absence of standardized guidelines and protocols for adequate care, insufficient knowledge among health workers regarding the pandemic, inadequate service organization, anxiety among health workers and the population. They suggested improvement in health communication, training for healthcare professionals, and the strategic utilization of social media and information and communication technology as a sustainable approach to advancing RMNCAH during a global health crisis such as COVID-19.[14]

After examining the impact of COVID-19 on FRH, we also investigated the effect of misinformation. Pregnant women and those seeking to conceive have been particularly affected by misinformation related to COVID-19 vaccination. Berkowitz and Vann emphasize that inaccurate information poses a barrier to optimizing vaccination rates among women of childbearing age, which is critical for safeguarding both maternal and infant health.[71] Beyond vaccination, online platforms have become breeding grounds for misinformation concerning women's reproductive health. John et al. assert that the digital landscape is rife with misleading information that compromises health outcomes and erodes medical trust. Their narrative review highlights the ideological roots of such misinformation and calls for evidence-based strategies to mitigate its effects.[72]

Misinformation does not merely affect individual health decisions; it extends to shaping health-related policies. Misleading narratives shaped by organizations such as Crisis Pregnancy Centers (CPCs) distort women's understanding of their reproductive health options, as documented by Polcyn et al. in their findings on crisis pregnancy centers in the U.S. found that institutions frequently disseminate biased information to dissuade

individuals from seeking comprehensive reproductive healthcare.[73-75] The fallout from such practices underscores the necessity for public education initiatives aimed at increasing awareness of ethical healthcare standards. As such, targeted interventions focusing on digital literacy and critical thinking are vital. Matos agreed that women's groups in politically polarized settings encounter challenges in accessing reliable information, indicating a need for community-based efforts to foster informed discussions about reproductive rights and health.[74]

In light of these findings, we see that there is limited integration concerning the application of health communication—like public messaging or community outreach—to mitigate these challenges. The pandemic exposed considerable gaps in the fair dissemination of health information and culturally relevant support systems. Therefore, health communication post-pandemic must adapt to effectively address the needs of women regarding reproductive health. This involves disseminating clear, evidence-based information about the impacts of COVID-19 on reproductive functions, menstrual health, and accompanying mental health challenges. Creating platforms for women to express concerns and share experiences can improve engagement with health resources, thereby fostering a supportive community that aids in mitigating mental health stressors stemming from reproductive health issues during the pandemic.[4]

The function of health communication in FRH during pandemics is inadequately examined and fragmented; thus, this scoping review addresses gaps in evidence (e.g., trauma-informed messaging frameworks) and links strategies like digital health literacy programs and community-driven initiatives, providing actionable recommendations for policymakers and healthcare practitioners.

Methods

This scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. We conducted a systematic literature search of peer-reviewed publications from January 2021 to December 2024. We searched four electronic databases: PubMed (National Library of Medicine), PsycINFO, Web of Science, and Google Scholar. Additional records were identified through citation searching of included studies and gray literature sources (organizational reports, policy briefs). Search terms combined three concept groups:

The first group focused on COVID-19 and related terms including "COVID-19" OR "SARS-CoV-2" OR "coronavirus" OR "pandemic".

The second group addressed female reproductive health using terms such as "female reproductive health" OR "women's health" OR "reproductive health" OR "menstrual" OR "fertility" OR "postpartum depression" OR "pregnancy" OR "maternal health".

The third group targeted communication related concepts, including "health communication" OR "communication strategies" OR "health literacy" OR "patient education" OR "misinformation" OR "risk communication".

This review further followed the Population-Concept-Context (PCC) framework to define inclusion criteria:

Population

Studies examining women of reproductive age (15-49 years) affected by the COVID-19 pandemic.

Concept

Studies addressing

The COVID-19's impact on female reproductive health outcomes (menstrual health, fertility, pregnancy outcomes, postpartum mental health). As well as the health communication strategies, interventions, or frameworks employed to address reproductive health challenges during the pandemic.

Context

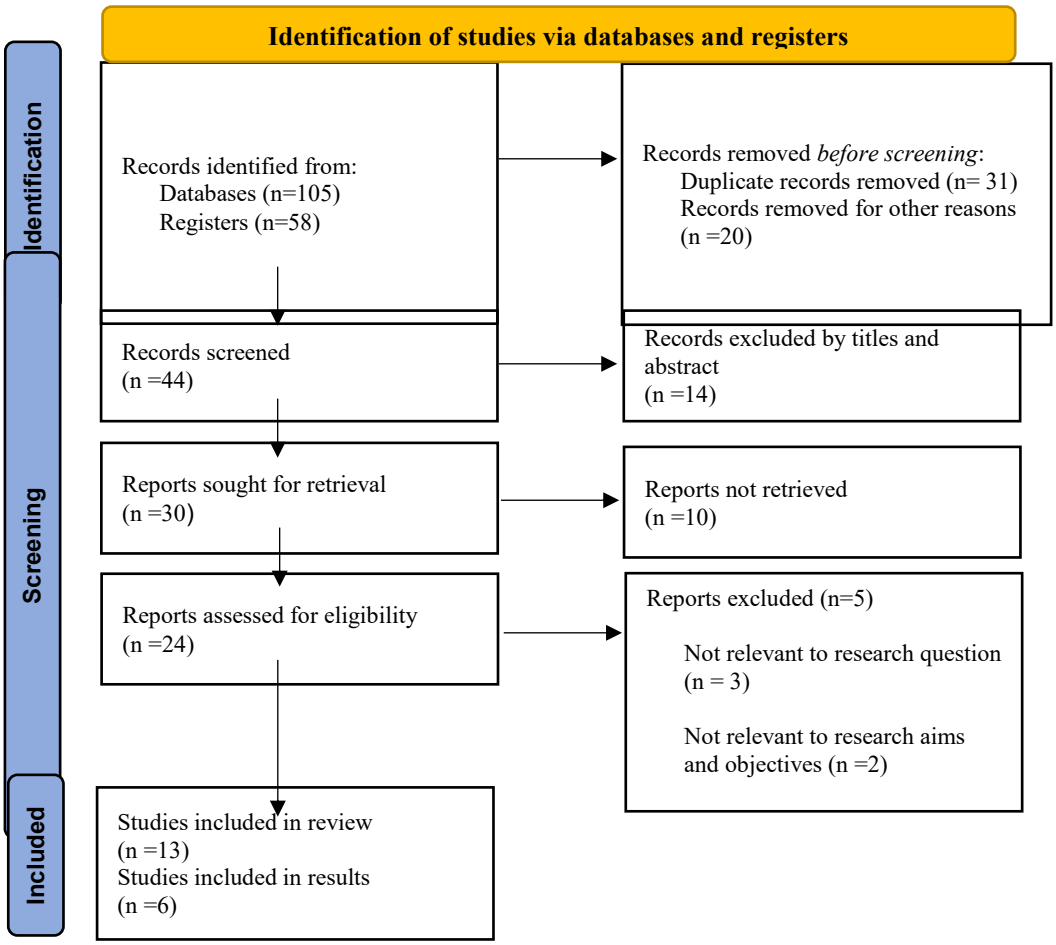
Post-pandemic period (2021-2024), any geographic setting, healthcare or community contexts.

Study types

Peer-reviewed primary research (quantitative, qualitative, mixed methods), systematic reviews, scoping reviews, and authoritative press releases reporting primary data.

Study selection process

Two reviewers independently screened all titles and abstracts against eligibility criteria using Microsoft



NOTE: Six studies contributed to the detailed thematic synthesis in Results. These six provided in-depth data on communication gaps, while remaining seven focused solely on clinical outcomes.

Figure 1: PRISMA-ScR flowchart illustrating the article selection process

Excel. Articles deemed potentially relevant by either reviewer advanced to full-text screening. The same two reviewers independently assessed full texts, with disagreements resolved through discussion until consensus. While formal inter-rater reliability was not calculated, all disagreements were resolved through discussion, with a third reviewer available for consultation if needed.

Data synthesis

The table above employed narrative synthesis with thematic analysis for qualitative data, following Thomas and Harden's approach. The synthesis proceeded in three stages:

Stage 1: Coding: We conducted line-by-line coding of study findings related to (a) COVID-19's physiological, psychological, and access-related impacts on FRH, and (b) any health communication strategies identified.

Stage 2: Descriptive themes: We grouped similar codes into descriptive themes (e.g., "vaccine-induced menstrual irregularities," "fertility treatment disruptions," "postpartum depression prevalence").

Stage 3: Analytical themes: We developed analytical themes that interpreted findings beyond individual studies, particularly focusing on the gap between extensive clinical documentation and the absence of communication intervention research

Results

Overview of included studies

The systematic search yielded 13 studies published between 2021 and 2024 that met the eligibility

Table 1: Data charting

S/N	Author (Year)	Country/ Setting	Study design	Sample Size	Key Outcomes Measures	Main Findings	Authors' Recommendation
1	Syeda & Yoon (2024)	International (review)	Narrative review	Multiple studies reviewed	Menstrual function, ovarian function, fertility, long COVID prevalence	Long-term COVID impairs women's menstrual periods, ovarian function, and fertility; SARS-CoV-2 through ACE-2 receptors may cause hormonal abnormalities; menstrual alterations after Sinovac (63.3%) more common than BioNTech (52.9%); long COVID more common in women (8.5%) than males; hormonal changes during puberty, pregnancy, menopause may affect long-term COVID in women.	Sex-sensitive longitudinal research needed; enhanced surveillance and targeted study for effective therapies; comprehensive care models including psychological support, physical rehabilitation, and specialized reproductive health services for women with long COVID.
2	Tokta et al. (2023)	Turkey	Cross-sectional retrospective	N=219 women of reproductive age	Menstrual cycle characteristics post-vaccination (cycle length, bleeding duration, volume, dysmenorrhea)	53.1% of women had menstrual abnormalities after COVID-19 vaccination; most prevalent changes: delayed menstruation (30.0%) and longer menstrual duration (22.5%); menstrual alterations after Sinovac (63.3%) more common than BioNTech (52.9%); women experienced greater rates of menstrual delay, prolonged duration, severe bleeding, and early menstruation after vaccination compared to before.	Inform and enlighten women prior to vaccination; individualized approach needed for women with bleeding diathesis.
3	Rideout (2023)	Global (multiple countries)	Press release (reporting peer-reviewed research)	Data from cycle monitoring apps (exact N not specified)	Menstrual bleeding volume and duration post-vaccination	Increased risks of heavier periods after first COVID-19 vaccination dose; most menstrual bleeding changes temporary and resolved after first cycle post-vaccination; changes usually mild and short-lived; biological mechanisms not yet explained.	Increase public awareness through information and communication about potential menstruation changes; encourage women with unusual/persistent changes to seek medical advice; continue research using cycle monitoring app data; healthcare guidance for patients with protracted alterations.
4	Lebar et al. (2022)	Multiple countries (systematic review)	Systematic review	Multiple studies reviewed	Menstrual cycle length, menstrual volume, types of irregularities	Menstrual volume changes and cycle length changes as consequences of SARS-CoV-2 infection; prolonged menstrual cycle most common irregularity; women mainly reported decreased menstrual volume.	Future studies should consider SARS-CoV-2 mutations, country conditions, and accurately describe features for comparability; assess psychological stress, vaccination status, COVID-19 therapy, comorbidities, and other confounding factors.

5	Costa & Menezes (2024)	Not specified	Narrative review	Review article	Biological and psychosocial impacts on menstrual cycle, vaccine effects, fertility	Both biological and psychosocial effects of SARS-CoV-2 infection/vaccination affect female reproductive organs and menstrual irregularity; various changes recorded making prevalence determination difficult; approximately half of women had menstrual irregularity (mostly polymenorrhea or hypermenorrhea) though fertility not affected.	No specific recommendations provided.
6	NYU Langone Health (2023)	United States (state-level analysis)	Press release (reporting peer-reviewed research)	State-level fertility data across all US states	Birth rates per 100,000 reproductive-age women, fertility trends by state	18 fewer births per month per 100,000 reproductive-age women in 2020; 9 fewer births per month in 2021 (approaching pre-pandemic norms); fertility rates fell more in states with more social distancing and liberal politics; conservative states had higher fertility rates; pandemic worsened social and economic inequality.	Detect and correct socioeconomic disparities affecting family planning during pandemics; study financial security, childcare access, climate change, and political instability in crisis pregnancy decisions; state governments should establish programs addressing economic challenges to support families.
7	Texas Children's Hospital (date not specified)	United States (Texas)	Clinical perspective/review article	N/A (institutional perspective)	Fertility service availability, telemedicine adoption, IVF access during pandemic	Family Fertility Center restored services: IVF cycles, oocyte retrievals, cryopreservation, embryo transfers, intrauterine inseminations; telemedicine offered for evaluations and follow-ups, reducing travel time and stress; ongoing communication maintained between patients and facility.	Women interested in family building should continue despite pandemic with treatment plans prioritizing safety; patients should stay informed about CDC and professional society recommendations; maintain ongoing communication with fertility facility following COVID-19 testing and safety standards.
8	Sahebi et al. (2024)	Multiple countries (meta-analysis)	Umbrella review and meta-analysis	N=9 meta-analysis studies included (pooling data from 243 initial articles)	Postpartum depression prevalence during COVID-19 pandemic	Prevalence of postpartum depression (PPD) during COVID-19 pandemic was25.27%(95% CI = 23.66-27.86); high heterogeneity between studies (I^2=0.0%); prevalence relatively high compared to pre-pandemic levels.	Healthcare providers should implement community programs to prevent, identify, and treat mental health concerns in pregnant and postpartum women; pregnant women particularly vulnerable to psychological distress during infectious disease outbreaks.
9	Blocklinger et al. (2025)	United States (Midwestern hospital, rural vs. urban)	Longitudinal cohort study	Pregnant and postpartum women from single Midwestern hospital (exact N not specified in abstract)	Prenatal depression rates, postpartum depression rates, rurality effects, COVID-19 impact	Rural participants more likely to exhibit clinical depression symptoms before pandemic: prenatal (8.63% rural vs. 6.49% urban) and postpartum (11.19% rural vs. 9.28% urban); during pandemic, urban participants had increased postpartum depression; rural participants endorsed more financial/labor concerns; urban participants expressed support system concerns.	Focus on prevention as PPD is common; support mental health in community and healthcare settings; enhance postpartum care through screening programs and policies; provide specific physical and psychological care to mothers during COVID-19; frequent follow-ups needed as PPD impairs social

							behaviors; assess mothers for depression from early pregnancy to postpartum.
10	Ciolac et al. (2023)	Romania	Cross-sectional study	Postpartum women in Romania (exact N not specified in table but substantial sample)	Postpartum depression severity (EPDS scores), risk factors, suicidal ideation	COVID-19 pandemic increased PPD prevalence relative to pre-pandemic levels; major depression (EPDS ≥13) observed in54.2%of subjects, minor depression in 15.6%;14.9%had suicidal ideation; PPD significantly associated with education level (higher education protective); risk factors: delivery type, socioeconomic status, health status, age, obstetric history.	Monitor women who gave birth during COVID-19 to reduce undetected postnatal depression; promote postpartum mental health screening for mother and child health; promote national attention to these issues; use risk factors for targeted screening and intervention; early health system preparation for future crises; more research on COVID-19 and postnatal depression needed.
11	Phelan et al. (2021)	Internatio nal (survey)	Cross-sectional survey	Women surveyed about reproductive health changes (exact N not specified)	Menstrual cycle changes, PMS severity, new menstrual symptoms (menorrhagia, dysmenorrhea, amenorrhea)	46%of women experienced menstrual cycle changes since pandemic began;53%reported worsening PMS symptoms; compared to pre-pandemic: 18% experienced new menorrhagia, 30% new dysmenorrhea, 9% with no previous missed periods reported missing periods; long-term health implications yet to be determined.	Future studies should address long-term impacts on women's reproductive health.
12	Li et al. (2023)	China	Cross-sectional study	Women who menstruated during COVID-19 infection (exact N not specified in your table)	Menstrual changes during acute COVID-19 infection, symptom resolution	66.9%of women who menstruated during COVID-19 infection experienced changes in cycle length, flow, or duration;84%reported symptom resolution within 1-2 months post-recovery, indicating transient nature.	Monitor long-term reproductive health outcomes; provide reassurance about temporary nature of changes.
13	Zanardo et al. (2020)	Italy	Case-control study	Postpartum mothers during quarantine (exact N not specified in your table)	Emotional problems in postpartum period, quarantine effects	Quarantine measures exacerbated emotional problems in postpartum mothers; strong relationship between pandemic stressors and postpartum depression development.	Provide enhanced psychological support for mothers during quarantine periods; address isolation and stress factors.

We independently charted data for each included study. Charting discrepancies were resolved through discussion.

criteria. These studies spanned diverse geographic contexts—including Turkey, the United States, Romania, Italy, China, and multi-country systematic reviews—and employed a range of methodologies, from cross-sectional surveys and longitudinal cohorts to umbrella meta-analyses and narrative reviews (see Table 1 for the complete data charting). The narrative synthesis, conducted in accordance with Thomas and Harden's three-stage approach, generated three descriptive themes and one overarching analytical theme, which are presented below.

Theme 1: Menstrual irregularities and cycle disruptions

Seven of the 13 included studies documented COVID-19-related menstrual disruptions, encompassing both infection- and vaccination-associated changes. Tokta et al. reported that 53.1% of Turkish women of reproductive age (N=219) experienced menstrual abnormalities following COVID-19 vaccination, with delayed menstruation (30.0%) and prolonged bleeding duration (22.5%) being the most prevalent alterations. Notably, vaccine type influenced the magnitude of these effects, with Sinovac recipients reporting a 63.3% irregularity rate compared to 52.9% among BioNTech recipients. Phelan et al. found that 46% of surveyed women experienced menstrual cycle changes since the pandemic's onset, while 53% reported worsened premenstrual syndrome symptoms; new-onset menorrhagia (18%), dysmenorrhea (30%), and amenorrhea (9%) were also documented. Li et al. observed that 66.9% of women who menstruated during active COVID-19 infection experienced changes in cycle length, flow volume, or bleeding duration, although 84% reported symptom resolution within one to two months post-recovery, indicating the transient nature of most changes.

A global study analyzing cycle-monitoring application data reported a 4% increase in heavy menstrual flow after the first vaccination dose, with changes resolving within one cycle for the majority of individuals. Lebar et al.'s systematic review across multiple countries confirmed that prolonged menstrual cycle length was the most commonly reported irregularity, with women predominantly reporting decreased menstrual volume. Costa and Menezes similarly noted that while approximately half of women experienced menstrual irregularity—most often polymenorrhagia or hypermenorrhea—fertility appeared unaffected. Syeda and Yoon's narrative review further corroborated these findings, documenting impaired menstrual periods and ovarian function in women with long COVID, with hormonal abnormalities attributed to SARS-CoV-2 interaction with ACE-2 receptors.Across these seven studies, the evidence converges on three conclusions: menstrual changes are widespread (affecting 46–67% of women depending on the population and exposure type), vaccine type mediates the severity of menstrual alterations, and the majority of reported changes are temporary and self-resolving.

Theme 2: Fertility rate declines and art disruptions

Three studies addressed the pandemic's impact on fertility outcomes and access to assisted reproductive technologies. NYU Langone Health's analysis of state-level data across the United States documented 18 fewer births per month per 100,000 reproductive-age women in 2020, with a partial recovery to 9 fewer births per month in 2021 as conditions approached pre-pandemic norms. This analysis further revealed that fertility rate declines were more pronounced in states characterized by stricter social distancing measures and more liberal political orientations, while conservative-leaning states maintained comparatively higher fertility rates—findings that underscored the role of socioeconomic and political context in reproductive decision-making during crises. Texas Children's Hospital provided an institutional perspective on service adaptation, documenting the restoration of fertility services—including in vitro fertilization cycles, oocyte retrievals, cryopreservation, embryo transfers, and intrauterine inseminations—alongside the adoption of telemedicine for evaluations and follow-up consultations, which reduced travel-related time and stress for patients. Syeda and Yoon's review also noted that SARS-CoV-2 may impair ovarian function and fertility through hormonal disruptions, reinforcing the biological plausibility of the observed fertility rate declines.

Theme 3: postpartum depression and maternal mental health

Four studies examined the pandemic's impact on postpartum mental health, consistently documenting elevated rates of depression among mothers. Sahebi et al.'s umbrella meta-analysis, pooling data from nine meta-analytic studies encompassing 243 initial articles, established a pandemic-era postpartum depression (PPD) prevalence of 25.27% (95% CI = 23.66–27.86)—substantially elevated compared to pre-pandemic estimates. Ciolac et al.'s Romanian cross-sectional study revealed even more severe outcomes: 54.2% of postpartum women met criteria for major depression (EPDS ≥13), 15.6% exhibited minor depression, and 14.9% reported suicidal ideation. Significant risk factors included delivery type, socioeconomic status, health status, age, and obstetric history, while higher education emerged as a protective factor.

Blocklinger et al.'s longitudinal cohort study identified important rural–urban disparities: rural women showed higher baseline depression rates both prenatally (8.63% vs. 6.49% urban) and postpartum (11.19% vs. 9.28% urban), while urban women experienced pandemic-specific increases in postpartum depression. The stressor profiles also differed, with rural participants endorsing financial and labour concerns and urban participants expressing support system concerns. Zanardo et al.'s case-control study in Italy demonstrated that quarantine measures directly exacerbated emotional problems among postpartum mothers, establishing a strong relationship between pandemic-induced isolation and the development of postpartum depression.

Theme 4: The absence of health communication interventions

The most significant analytical finding to emerge from the synthesis was the complete absence of empirical research testing health communication interventions across all 13 included studies. While seven of the 13 studies (53.8%) explicitly recommended improved health communication in their conclusions—including pre-vaccination education (Tokta et al.), public awareness campaigns (Rideout), community mental health programmes (Sahebi et al.), screening initiatives (Blocklinger et al.; Ciolac et al.), and enhanced patient–provider dialogue (Texas Children's Hospital)—not a single study empirically tested, implemented, or evaluated a communication intervention.

This disconnects between the recognized need for communication strategies, and the absence of research action constitutes the central gap documented by this review. The reviewed literature extensively catalogues the physiological and psychological effects of COVID-19 on female reproductive health but does not explore how public messaging could alleviate anxiety, how community outreach might reduce isolation among postpartum mothers, or how patient–provider communication frameworks could improve fertility care access.

Discussion

Principal findings

This scoping review of 13 studies published 2021-2024 reveals a critical paradox in COVID-19 and female reproductive health research. While the pandemic's impacts are extensively documented, health communication strategies to address these impacts are conspicuously absent from empirical literature. Our review yielded three principal findings:

First, physiological impacts are well-documented across menstrual health, fertility, and reproductive function. Studies confirmed that 53.1% of Turkish women experienced menstrual abnormalities post-vaccination, with vaccine type influencing outcomes (63.3% for Sinovac vs. 52.9% for BioNTech). Importantly, 84% of menstrual changes resolved within 1-2 cycles, indicating their transient nature. Fertility rates declined substantially in 2020 (18 fewer births monthly per 100,000 women), though trends approached pre-pandemic levels by 2021.

Secondly, psychological burdens on women's mental health were substantial and persistent. Postpartum depression prevalence reached 25.27% during the pandemic—a marked elevation from pre-pandemic estimates. In Romania, 54.2% of postpartum women exhibited major depression, with 14.9% experiencing suicidal ideation. Rural-urban disparities emerged, with rural women showing higher baseline depression rates but urban women experiencing pandemic-related increases, reflecting distinct stressor patterns.

Lastly, and most significantly, our review identified complete absence of empirical research testing health communication interventions. While 7 of 13 studies (53.8%) explicitly mentioned communication barriers or recommended improved strategies, zero studies evaluated communication frameworks, digital health literacy programs, myth-busting campaigns, or trauma-informed messaging approaches. This disconnects between recognized need and research action constitutes the most critical gap documented by this review.

Contextualizing the findings within broader literature

The findings from the 13 included studies are broadly consistent with wider evidence on COVID-19's impact on reproductive health. Independent investigations outside this review's scope have similarly documented increases in menstrual irregularities and hormonal imbalances among women during the pandemic. For instance, Chavan et al. reported comparable menstrual disruptions following the second wave of COVID-19 infection in a tertiary care center in Mumbai, while Носенко et al. observed measurable changes in reproductive hormone levels—including elevated prolactin—among women who survived moderate to severe COVID-19, providing a plausible endocrine mechanism for the menstrual disruptions documented in this review's included studies. More broadly, Garibidi et al. and Maham and Yoon have confirmed that SARS-CoV-2 may disrupt hormonal homeostasis and affect overall reproductive function through direct viral tissue damage mediated by ACE2 receptors and through immune and inflammatory pathway activation.

The psychological dimensions of the pandemic's reproductive health impact are also corroborated by broader scholarship. Marfu'ah et al. highlighted women's heightened vulnerability in performing reproductive functions during the pandemic, emphasizing the compounding effects of stress, anxiety, and nutritional insecurity on reproductive outcomes. Adedini et al.'s scoping review on sub-Saharan Africa further documented that social distancing protocols, healthcare resource reallocation, and economic strain collectively undermined access to essential reproductive services, including family planning and prenatal care—a finding that extends the geographic relevance of this review's predominantly high-income country evidence base. This contextualization strengthens the external validity of the present review's findings while highlighting the global scope of the pandemic's reproductive health impacts.

Interpretation: The communication gap as missed opportunity

The absence of communication intervention research is particularly striking given the documented consequences. Multiple studies noted misinformation affecting vaccine uptake among pregnant women, confusion about service availability during lockdowns, and patient anxiety exacerbated by information voids. Yet despite these acknowledged barriers, researchers focused exclusively on documenting problems rather than testing solutions. This gap has tangible consequences. When 53.1% of women experience menstrual irregularities post-vaccination without pre-emptive communication preparing them for temporary changes, vaccine hesitancy intensifies. When postpartum depression affects one in four new mothers during a pandemic that isolated women from traditional support systems, the absence of tested communication strategies for virtual peer support or mental health screening represents a profound missed opportunity for intervention research.While not tested in our included studies, emerging frameworks from health communication and adjacent COVID-19 research suggest evidence-based directions for future intervention research. These strategies are drawn from literature outside our systematic search but address the specific gaps we identified.

Limitations

The focusing on 2021–2024 may exclude foundational studies from 2020 that shaped early pandemic responses. Furthermore, most reviewed studies are from high-income countries, limiting insights into low-resource or marginalized populations and Reliance on peer-reviewed journals may overlook grassroots initiatives or community-based communication interventions. Lastly, the PRISMA-ScR-guided methodology did not integrate communication theories, weakening actionable policy recommendations.

Recommendations

A WHO-grounded communication framework for future research and practice

The findings of this review point to a critical need for evidence-based communication strategies to address the impacts of COVID-19 on female reproductive health. To guide future research and practice, this review adopts the World Health Organization (WHO) Communication Goals Framework, which aims to provide information, advice, and guidance to decision-makers and key audiences to prompt action that protects the health of individuals, families, communities, and nations (see Figure 2).

Guided by this framework and the data derived from the reviewed studies, Table 2 presents a synthesized taxonomy of potential communication strategies—organized by communication channels, target audiences, strategic approaches, and expected outcomes—that address the specific gaps identified in this review. It bears emphasizing that these strategies were not identified within the 13 included studies; rather, they represent evidence-based approaches drawn from the broader health communication literature that could address the documented gaps. Table 3 further illustrates how selected communication strategies from external literature correspond to the specific FRH impacts identified in this review, mapping research titles to health impacts, proposed interventions, and communication approaches.

FRH and health communication

The table below illustrates the application of the methodologies mentioned above concerning female reproductive health during COVID-19 and the role of communication have been integrated in some cases.

Specified recommendations for research and practice

Building upon the WHO framework and the identified communication gap, the following targeted recommendations emerge.

Myth-busting and digital health literacy interventions

Future studies should empirically test the application of myth-busting campaigns, particularly employing the "truth sandwich" technique, to address fertility-related misconceptions linked to COVID-19 vaccination. Collaboration with social media platforms such as TikTok, Facebook, and WhatsApp to disseminate accounts from women recovering from prolonged COVID could normalize discussions about menstrual health and reproductive impacts.

Evidence from the health communication literature supports the efficacy of myth-busting approaches for reproductive health misinformation. Research demonstrates that well-crafted corrections delivered by credible health professionals can positively influence beliefs, attitudes, and behaviors in line with scientific consensus. The "truth sandwich" method—stating accurate information first, identifying the myth, and reiterating the truth—has proven effective in altering public perceptions in COVID-19 contexts. Audience segmentation by age, language, and cultural preferences enhances the relevance and impact of debunking messages, while real-time monitoring of misinformation trends ensures adaptive, context-sensitive campaign delivery. These approaches directly address the gap identified in this review: Tokta et al.'s finding that 53.1% of women experienced menstrual changes post-vaccination occurred without any accompanying pre-vaccination education or public messaging, likely amplifying vaccine hesitancy.[29-38]

Risk communication models

The application of models such as the Extended Parallel Process Model should be explored to formulate fear-appeal messages that effectively balance risk perception and self-efficacy in female reproductive health scenarios. Messages that acknowledge uncertainty while providing actionable guidance have been shown to outperform both dismissive reassurance and alarmist framing. Risk communication frameworks in reproductive health must navigate the interplay between risk perception, empowerment, and equitable care delivery. The Risk

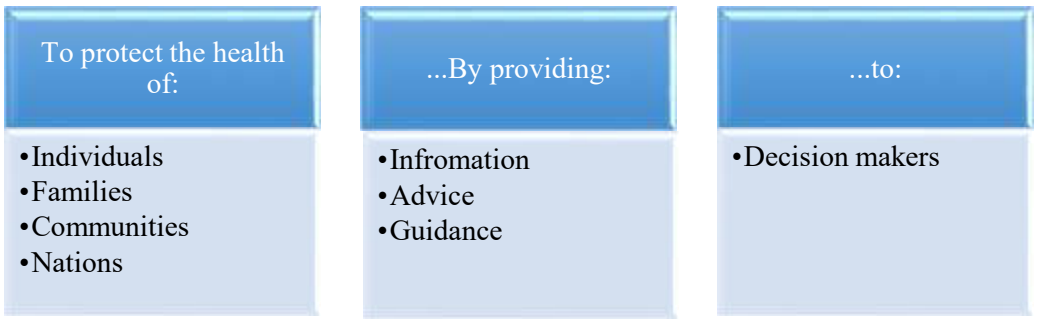


Figure 2: World Health Organization (WHO) communication goals framework.

Table 2: Potential communication strategies from broader literature (not found in reviewed studies)

Category	Subcategories	Example
Communication Channels	-Digital platforms	-Social media, Telehealth apps
	-Community outreach	-Health campaign, Informational sessions
	-Clinical counselling	- one-on-one consultations
Audience	-Marginalized groups	-Low-income persons, racial/ethnic minorities
	-Postpartum Women	-New Mothers experiencing health issues
	-Adolescents	-Young girls with reproductive education gaps
Strategies	-Trauma-informed messaging	-Messages that acknowledge past trauma and promote safety
	-Myth-busting campaigns	-Messages countering misconceptions about reproductive health during COVID-19.
	-Culturally sensitive communication	-Tailored messages that in line with specific cultural beliefs and practices
Outcomes	-Improved health literacy	-Increased awareness of reproductive health
	-Reduced anxiety	-Reduced level mental health-related issues (e.g. postpartum depression)
	-Equitable access	-Enhanced access to information and services for marginalized groups

Note: *The communication strategies in this table were NOT identified in the 13 included studies from our systematic search. They represent evidence-based approaches from health communication literature that could address the gaps we identified. These frameworks are discussed as future research directions in the Discussion section, with appropriate citations to sources outside this review*

Perception Attitude framework, when combined with digital interactivity, has been shown to enhance self-efficacy and reduce perceived risks in health communication. Critically, dominant risk discourses in reproductive health often conflict with equity goals; centering women's lived experiences ensures that messages empower rather than stigmatize. This is directly relevant to the review's findings, as the 18 fewer births per 100,000 women documented by NYU Langone Health occurred within an information environment saturated with unaddressed pandemic-related fears about family planning.[48-50]

Trauma-informed training for healthcare providers

Communication modules for healthcare providers should be developed and evaluated, highlighting cultural humility and sensitivity to effectively address pandemic-induced trauma in clinical interactions. Frameworks such as the TRIADS model could guide patient–provider communication by systematically inquiring about pandemic-specific adversities, assessing distress levels, and identifying existing resilience factors.

Table 3: Mapping evidence-based communication strategies to COVID-19's impacts on female reproductive health

Research Title	FRH Impact	Intervention	Communication Strategy
-Health messages that engage audiences after the COVID-19 pandemic: content analysis of Chinese posts on social media.[67] -The menstrual cycle and the COVID-19 pandemic.[66]	-Menstrual Irregularities	-Myth-busting social media campaign	-Correcting vaccine misinformation via Xiaohongshu posts using credible sources and textual strategies
-Postpartum depression during the COVID-19 pandemic: an umbrella review and meta-analyses.[26]	Postpartum Depression	Virtual peer support networks	Online forums and telehealth platforms reduce isolation among postpartum mothers
-Impact of the COVID-19 Pandemic on Access to Fertility Care: A Retrospective Study at a University-Affiliated Fertility Practice.[68] -COVID-19-related uncertainty: fertility staff experiences of its sources, processing, responses, and consequences.[69]	Fertility Access Barriers and Infertility Concerns	-Policy advocacy via community coalitions - Clear risk communication frameworks	-Lobbying for uninterrupted ART services through clinic adaptations and transparent communication -Clinics disseminating FAQs about COVID-19's lack of direct impact on fertility
Quality communication can improve patient-centred health outcomes among older patients: a rapid review.[70]	Patient-Provider Communication	Trauma-informed training programs	Workshops for providers to address pandemic-related trauma in reproductive care

Trauma and reproductive health are interconnected, with evidence demonstrating that traumatic experiences adversely affect both mental and physical aspects of women's reproductive systems. Integrated trauma-informed care models that combine gynecological and psychiatric support have been shown to reduce re-traumatization and enhance patient satisfaction. The review documented extensive pandemic-related traumas—quarantine-exacerbated emotional problems (Zanardo et al.), 54.2% major depression with 14.9% suicidal ideation (Ciolac et al.), and distinct rural–urban stressor patterns (Blocklinger et al.)—yet none of the 13 studies assessed whether trauma-informed communication affected outcomes.[56-60]

Virtual peer support networks

Empirical testing of virtual peer support platforms—including online forums, telehealth-based group sessions, and structured peer-group clubs—should be prioritized, particularly for postpartum mothers experiencing isolation and for women navigating fertility treatment disruptions during crises. Virtual peer support models have demonstrated effectiveness in chronic disease management and mental health contexts, with evaluations showing improvements in participants' well-being and health management skills.

Smartphone-based interventions in resource-limited settings have facilitated peer networks among health workers, while structured peer-group clubs for adolescent girls in South Africa have been associated with increased self-esteem and improved access to sexual and reproductive health services. This review's finding of 25.27% PPD prevalence during pandemic-imposed isolation underscores the urgency of testing such models for postpartum mothers.[39-43]

Policy advocacy through community coalitions

Research should examine how gender-responsive, community-based coalitions can effectively advocate for the classification of reproductive health services as essential during health emergencies, ensuring uninterrupted access to ART, prenatal care, and contraception. Community coalitions employing gender-responsive frameworks and community-based prevention marketing have been shown to effectively address systemic health inequities. Flexibility in advocacy strategies—from

confrontational to collaborative and educational approaches—empowers coalitions to navigate complex power dynamics.

This review found that while NYU Langone Health recommended state-level programmes to address economic barriers to family planning and Ciolac et al. called for national attention to PPD, no studies examined whether policy advocacy or structural communication strategies were implemented or evaluated.[44-47]

Participatory co-design with marginalized populations

Future research must involve marginalized women in the co-design of communication strategies through focus groups, citizen journalism, or narrative-based interventions, ensuring that strategies accurately represent the lived experiences of the most vulnerable populations. Narrative-based interventions, particularly digital storytelling, have emerged as transformative tools for enabling women to articulate experiences, reframe trauma, and challenge stigmatizing discourses around reproductive health. Participatory storytelling among young Latinas, for example, has illuminated intersections of migration, reproductive health, and social inequality, informing inclusive policy discussions. Analysis of YouTube birth stories during the pandemic identified themes of loss, hospital experiences, and provider communication that directly

influenced clinical practice improvements. Such approaches could have addressed the isolation and trauma documented across the review's included studies.[53-55]

Conclusion

This scoping review systematically mapped evidence on COVID-19's impact on female reproductive health and the role of health communication in mitigation efforts across 13 studies published 2021-2024.The review confirms extensive clinical documentation of COVID-19's multifaceted reproductive health impacts, Menstrual irregularities affected 50-67% of women post-infection or vaccination, though most (84%) resolved within 1-2 cycles. Fertility rates declined by 18 births per 100,000 women, with significant ART service disruptions during lockdowns. Secondly, Postpartum depression prevalence reached 25.27% during the pandemic, significantly exceeding pre-pandemic levels. Rural and socioeconomically disadvantaged women experienced heightened vulnerability. Lastly, Healthcare disruptions affected contraception access, in-person abortion services, prenatal care, and fertility treatments, with marginalized populations experiencing disproportionate barriers. Researchers must champion interdisciplinary collaboration, merging epidemiological rigor with media innovation to craft narratives that heal, inform, and mobilize. Future research must prioritize trauma-informed, culturally resonant communication frameworks, ensuring that post-pandemic recovery is not only equitable but also rooted in the collective strength of women's voices.

Contribution of this review

This review demonstrates that while COVID-19's reproductive health impacts are well-characterized clinically, the communication strategies to address them remain critically understudied. By systematically documenting this gap and identifying evidence-based pathways forward from health communication literature, we provide a roadmap for researchers, practitioners, and policymakers to ensure more comprehensive responses to current and future health crises affecting women's reproductive health.The COVID-19 pandemic exposed vulnerabilities in reproductive health communication infrastructure. Addressing these gaps is essential for equitable post-pandemic recovery and resilience-building for inevitable future challenges.

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Authors contributions

Author(s) played a substantive role in shaping the study's conceptualization and design, in conducting and interpreting the analyses, and in the writing and refinement of the manuscript. Author(s) was actively involved in drafting sections of the article and in revising it to enhance its scholarly rigor and intellectual coherence. In line with AJRH authorship criteria, author(s) have reviewed and approved the final version for publication and accept collective responsibility for the integrity and accuracy of the work.

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