Nursing Interventions for Pregnant Women in Community during the COVID-19 Pandemic: An Integrative Review

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Abstract

The COVID-19 pandemic highlighted the need for nursing interventions for pregnant women, emphasizing both physical and mental health. The research aimed to investigate empirical research on nursing care for pregnant women in community settings during the COVID-19 pandemic using an integrative review. The search terms included nursing care, pregnant women, COVID-19, and community. The databases used in this review were CINAHL, BASE, MEDLINE, and Springer Nature Journals. The Mixed Methods Appraisal Tool appraised was used to assess the quality of the studies. This study used thematic analysis to review ten articles focused on nursing care for pregnant women in the community. Two nursing care models emerged: 1) utilization of digital technologies and 2) resilience and psychosocial support. Telehealth and psychosocial interventions are crucial for enhancing maternal health during a health crisis or pandemic. Insufficient information and social support emphasize the necessity for structured communication channels and public health systems to assist pregnant women. Therefore, telemedicine should be integrated with health education and psychological intervention in community health services to reduce risks and ensure continuing support for pregnant women in the community.

Introduction

COVID-19 has been officially confirmed and has led to a significant increase in deaths as the virus has spread to millions of people worldwide (World Health Organization: WHO, 2020). Pregnant women are at greater risk of getting disease from other respiratory viruses than people who are not pregnant, and it sometimes causes adverse outcomes for the mother (Centers for Disease Control and Prevention (CDC), 2019). Pregnancy increases the susceptibility to infections (Liang & Acharya, 2020). COVID-19-related severe acute respiratory syndrome (SARS) is due to the transmission route, primarily via respiratory condensations from an infected person into the air (WHO, 2020). SARS-CoV-2 case count in April 2020 was over 2.1 million, including 108 pregnant women, while the respiratory syncytial virus affects 66.4 million people worldwide with 2% to 9.3% pregnancy infection rates and affected perinatal deaths (Schwartz & Dhaliwal, 2020). Previous studies showed that severe acute respiratory syndrome (SAR) and COVID-19 during pregnancy were associated with a high risk of preterm birth, spontaneous miscarriage, intrauterine growth restriction, and maternal and neonatal

complications (Wong et al. et al., 2004; Zhu et al., 2020). Previous studies indicated that most maternal deaths linked to COVID-19 occurred in pregnant women with comorbidities that may cause severe outcomes (Kazemi et al., 2021). Meanwhile, pregnant women with confirmed COVID-19 infections and unattended antenatal services were at risk of maternal death, stillbirth, and other adverse perinatal outcomes (Larki et al., 2020). In addition, neonatal outcomes faced fetal heart rate disorder, hospitalization in the neonatal intensive care unit (37.5%), and the need for resuscitation in the first minute (28.1%) (Mohebbi et al., 2023). In-Hye Song and Kyung-Ah Kang (2024) found that the prevalence of underweight infants born during COVID-19 was 30.4% (P=0.27), higher than the pre-COVID-19 rate of 22.5%, and the prevalence of wasting was 2.5% during COVID-19, compared to 0% (P=0.27) before the outbreak. Moreover, Li et al. (2024) found there was a significant correlation (P<0.05) between prenatal stress, family environment, and social-emotional issues in children during the COVID-19 pandemic. The pandemic affected all aspects of pregnant women's lives, including antenatal care (ANC) and essential care provided to all pregnant women (Anggraeni et al., 2023). ANC guarantees that pregnant women can deliver a healthy infant without adverse health repercussions through health promotion, disease prevention, early detection, and management of complications and pre-existing diseases (Tola et al., 2021). COVID-19 posed direct health risks to pregnant women and substantially disrupted maternal health services, leading to significant psychosocial impacts on pregnancy. Moreover, pregnant women in the community during the COVID-19 outbreak worldwide were restricted and quarantined, which has caused general panic and psychological stress in pregnant women (Bao et al., 2020). The significant impact of epidemics on health was anxiety, as well as unfamiliar physical symptoms or the broadcast of news related to an unknown disease and various mental health-related complications (Iravani et al., 2023). Psychosocial issues, including social isolation, insufficient information regarding neonatal care, insufficient public transportation, and insufficient current information about COVID-19, were identified as the primary contributors to an additional investigation (McDonald et al., 2020). One study identified that insufficient social support, slight face-to-face engagement with healthcare personnel, and inadequate knowledge significantly impacted pregnant women and childbirth during the COVID-19 pandemic (Meaney et al., 2022).

Objectives

Nursing care for pregnant women during the COVID-19 pandemic is essential in preventing unnecessary recommendations. Previous studies examined the nursing care provided by maternity care experts, such as healthcare workers or community nurses, during the COVID-19 pandemic to deliver the most appropriate nursing care for pregnant women. Therefore, this integrative review aimed to investigate empirical research on nursing care for pregnant women during the COVID-19 pandemic.

Scope of the Review

This integrative review focuses on nursing care interventions for pregnant women during the COVID-19 pandemic, specifically in community settings. It includes studies published between 2020 and 2024, encompassing quantitative, qualitative, and mixed-methods research. The review focuses on telehealth, home visits, and psychosocial support interventions and examines maternal and neonatal health outcomes and psychosocial well-being. Studies conducted in hospital or postpartum settings are excluded, as the review specifically targets community-based nursing care.

Literature search

The literature search was conducted using the following databases: CINAHL serves as the primary database for nursing and allied health literature, encompassing nursing journals; BASE is an open-access academic resource for international research; Springer Nature Journal is a specialized high-impact healthcare publication that ensures comprehensive coverage of COVID-19-related nursing research", and MEDLINE offers healthcare research with esteemed nursing publications. The literature review defined terms or concepts under review questions and identified keywords. The number of articles yielded from each database varies depending on the keywords used. The main search terms included 'COVID-19',

'pregnant women' or 'pregnancy,' 'community,' and 'nursing care.' In addition, Boolean operators 'AND' and 'OR' and Truncation: $ were included in the search parameters. Therefore, articles published from 2020 to 2024 were selected from online databases to align with the COVID-19 pandemic period.
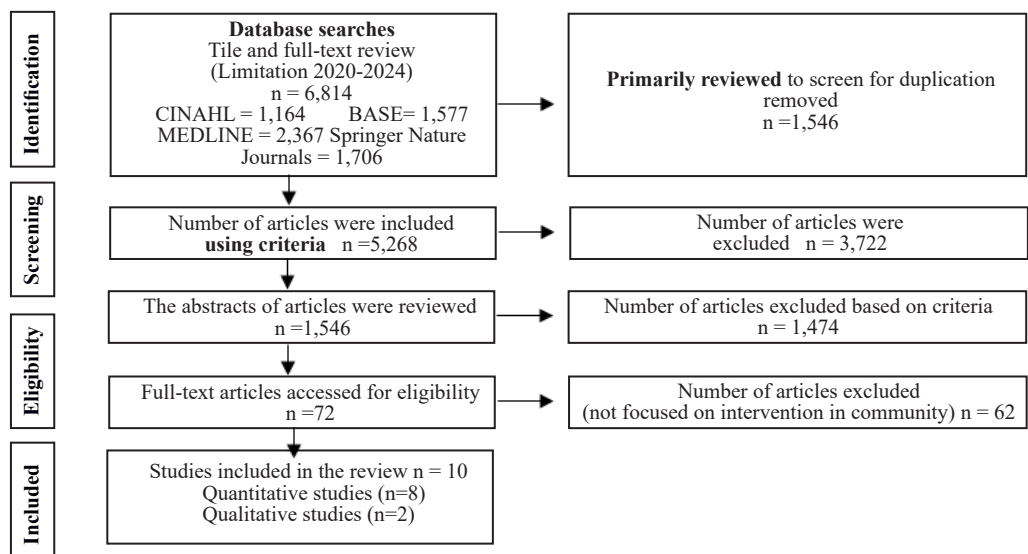
Eligibility Criteria:
To narrow the scope of the review, inclusion/exclusion criteria were set to determine its boundaries (Table 1).

Table 1: Inclusion and Exclusion Criteria for Study Selection

Inclusion criteria	Exclusion criteria
• Primary sources consisted of qualitative research, such as descriptive, phenomenological, and ethnographic qualitative research, and quantitative research, such as RCTs, cross-sectional, and descriptive studies. • Published in English • Publish during 2020-2024 • Full-text "unless the full text is unavailable." • English language • Content of COVID-19, pregnant women or pregnancy, and intervention, community	• Abstracts • Secondary sources included reviews, editorials, meta-analyses), non-original research, non-peer-reviewed articles, meta-ethnography • Book review • Content involving hospital-based interventions or postpartum care and not relevant to community interventions

The search strategy was conducted, as shown in Figure 1. The search yielded 6,814 full-text articles relevant were retrieved. The topics of the 1,546 papers were removed after screening duplicates. The titles of the remaining 5,268 articles were reviewed using the inclusion criteria. Three thousand seven hundred twenty-two articles were excluded for not focusing on COVID-19, not being pregnant women or pregnant, not intervening or nursing, and not being original research articles. The abstracts of the remaining 1,546 articles were then reviewed. One thousand four hundred seventy-four articles were excluded based on criteria. The remaining 72 papers were assessed for eligibility and focused on COVID-19, pregnant women, and interventions or nursing. Subsequently, 62 articles were excluded because they were not focused on community or empirical research studies. Sixty-two articles were excluded because they were not focused on community or empirical research studies". The criteria for exclusion could be more detailed, especially regarding what is meant by "intervention in the community."

Finally, publications consisting of 10 papers, including 10 quantitative studies and 2 qualitative studies, met the inclusion criteria and were included in the data analysis of this integrative review.


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Identification
┌──────────────────────────────┐        ┌──────────────────────────────┐
│      Database searches        │        │ Primarily reviewed to screen  │
│   Tile and full-text review   │───────▶│     for duplication removed    │
│    (Limitation 2020-2024)     │        │          n =1,546              │
│          n = 6,814            │        └──────────────────────────────┘
│ CINAHL = 1,164    BASE= 1,577 │
│ MEDLINE = 2,367 Springer Nature│
│      Journals = 1,706         │
└──────────────────────────────┘

Screening
┌──────────────────────────────┐        ┌──────────────────────────────┐
│ Number of articles were included│──────▶│ Number of articles were        │
│   using criteria  n =5,268     │        │  excluded   n = 3,722          │
└──────────────────────────────┘        └──────────────────────────────┘

Eligibility
┌──────────────────────────────┐        ┌──────────────────────────────┐
│ The abstracts of articles were │──────▶│ Number of articles excluded     │
│        reviewed  n =1,546      │        │   based on criteria n = 1,474  │
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┌──────────────────────────────┐        ┌──────────────────────────────┐
│ Full-text articles accessed for│──────▶│ Number of articles excluded     │
│    eligibility  n =72          │        │(not focused on intervention in │
└──────────────────────────────┘        │   community) n = 62            │
                                         └──────────────────────────────┘
Included
┌──────────────────────────────┐
│ Studies included in the review │
│          n = 10                │
│   Quantitative studies (n=8)   │
│   Qualitative studies (n=2)    │
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Finger 1: Flow diagram of literature research

Data Extraction:

Data were extracted from each study utilizing a standardized form to record important information such as study design, population, nursing interventions, and outcomes. Thematic analysis was employed to synthesize qualitative data and identify common themes, whereas descriptive statistics were utilized to summarize quantitative data for evaluating intervention effectiveness. Integrating both data types offered a comprehensive overview of nursing care for pregnant women during the pandemic. The Mixed Methods Appraisal Tool (MMAT) was utilized for quality assessment to ensure the rigor of the included studies (Hong et al., 2018). The characteristics and summaries of the included studies are illustrated in Table 2.

Quality Assessment

The MMAT was chosen for its comprehensive evaluation criteria, which are appropriate for assessing diverse research designs, including qualitative and quantitative studies. Each study was conducted according to the five quality criteria of the MMAT relevant to the specific study design. The evaluation concentrated on the methodological quality, encompassing research objectives, methodologies, data collection processes, participant selection, and interpretation of findings. The systematic quality appraisal improved the rigor and trustworthiness of the review findings. Ten articles included studies evaluated for quality based on the MMAT checklist. Overall, the studies supported the aims of investigating empirical research on nursing interventions for pregnant women during the COVID-19 pandemic, including eight quantitative and two qualitative research.

Data analysis

The final studies selected for the review were empirical. The literature included various study designs: descriptive, cross-sectional, cohort, retrospective, quasi-experimental, randomized controlled trial, longitudinal qualitative study, and phenomenological design. The evaluation was more complex, utilizing various methodologies (Whittemore & Knafl, 2005). The research questions guided the analysis of the ten articles, and the studies were compared and analyzed for similarities and differences. Data with similar contexts were assembled. The four steps of data analysis included 1) all articles were examined to identify key findings and methodological approaches, 2) data were extracted using a standardized form that verified study characteristics, techniques, and outcomes, 3) thematic analysis was conducted by researchers who coded the findings and organized them into first topics, and 4) themes emerged through researcher discourse and consensus to identify two themes related to nursing interventions for pregnant women in the community during COVID-19. This systematic technique was applied and ensured the findings' rigor.

Table 2: Characteristics and summary of included studies

Study	Authors	Aim	Method	Data collection	Participants	Finding
1	Iravani1, et al. 2023	To examine the impact of tele medicine on health anxiety and pregnancy-related anxiety in pregnant women during the COVID-19 epidemic in Iran.	Quasi-experimental study	Provide education about nutrition, personal hygiene, prevention, pregnancy risk factors, and routine pregnancy care through telephone applications, including text messages, WhatsApp, Telegram, and video clips	104 pregnant women were in two groups (intervention: n = 52, control: n = 52)	Health anxiety scores of the control group were significantly higher than those of the experimental group, and the mean scores of pregnancy-related anxieties in the control group were significantly higher than the experimental group.

Table 2: Characteristics and summary of included studies (continued)

Study	Authors	Aim	Method	Data collection	Participants	Finding
2	Shahri, et al., 2024	To evaluate the impact of	Quasi-experi mentalexperi mentalexperi mental study	Provide education about nutrition, personal hygiene, prevention, pregnancy risk factors, and routine pregnancy care through telephone applications, including text messages, WhatsApp, Telegram, and video clips	104 pregnant women were in two groups (intervention: n = 52, control: n = 52)	Health anxiety scores of the control group were significantly higher than those of the experimental group, and the mean scores of pregnancy -related anxieties in the control group were significantly higher than the experimental group.
3	Silva et al., 2023	to know the experience of being pregnant and using technologies for gestational care during the COVID-19 pandemic.	Qualitative study	A semi-structured interview script (characterization of the participants; and the guiding questions on experience of pregnancy during the pandemic and the use of digital technologies in the gestational period.	A total of 20 pregnant women who used digital technologies care during the pandemic	Two categories emerged: "Women's feelings about being pregnant during the pandemic of COVID-19", "Women's experiences with the use of digital technologies in pregnancy care
4	Kia et al., 2023	To determine the effect of a mobile-based health educational intervention on stress-induced among pregnant women during COVID- 19 pandemics	Randomized controlled trial	30-minute education sessions through Mobile health	80 pregnant women (40 intervention and 40 control groups)	The mean COVID-19 stress score after the intervention, the mean stress score of COVID-19 in the intervention group was significantly lower than the control group
5	Özkan Şat, S., & Yaman Sözbir, Ş., 2021	To identify the use of mobile applications by pregnant women in receiving health information, counseling, and healthcare during the COVID-19 pandemic	technology- A WhatsApp	An online questionnaire form about sociodemographic characteristics and features of using mobile applications	376 pregnant women agreed to participate in the study	77.9% of participants reported using pregnancy-related mobile applications
6	Marvi et al., 2023	To determine the effect of telemedicine-based massage training on spouses on the resilience of pregnant women during the coronavirus pandemic.	Randomized clinical trial Randomized clinical trial	Training by telemedicine	120 pregnant women attending health care centers (60 in each group)	Resilience score showed significant changes in resilience scores after the the 4 days of intervention
7	Khademho sseini at al., 2024	To investigate the views of pregnant women on receiving tele-pregnancy care using the technology acceptance model (TAM).	A cross-sec-tional study	The telemedicine acceptance questionnaire was based on an extended TAM	200 mothers from 20 comprehensive health centers	95.5% of the Participants highly agreed with incorporating telemedicine into their healthcare routine. The lowest mean scores of domains were related to technology anxiety and perceived risk.

Table 2: Characteristics and summary of included studies (continued)

Study	Authors	Aim	Method	Data collection	Participants	Finding
8	Anokwuru, & Mavis, 2022	To present the lived experience of utilization of antenatal services among pregnant women in the COVID-19 pandemic	A phenomenological design	The telephone or e-platforms (Zoom and Google meet)	12 pregnant women	Four themes emerged, including fear of contracting COVID-19 during antenatal; limited available antenatal services, coping with the new normal and need for digital health education
9	Tan et al., 2023	To explore the experiences of maternity service leaders and to understand perspectives on what happened in health services and what was required of a leader during the COVID-19 pandemic	A longitudinal qualitative study	An interview guides in general descriptions of the COVID-19 response	11 maternity care leaders	One overarching theme, 'challenges of being a maternity service leader during the pandemic,' encompassed participants' experiences, and four sub-themes immerge
10	Chardalias et.al., 2022	To investigate the management of patients with COVID-19 requiring high-quality nursing care to improve patient outcomes, along with high demands on workload and human resources	A retrospective study	An extensive review of the relevant literature of the last 15 years	Electronic Databases (Google Scholar, Pubmed, Medline, Scopus, the Hellenic Academic Libraries Association –HEAL link and scientific journals	Individuals need a patient care plan

Results

TThis integrative review investigated empirical research on nursing care for pregnant women during the COVID-19 pandemic and answered what nursing care was used in the community for pregnant women during the COVID-19 pandemic. The nursing care model during COVID-19 consisted of nursing care for the physical and mental health of pregnant women in the community.

Utilization of digital technologies

Digital technologies were used in nursing interventions to support pregnant women's physical and psychological health. Mobile health and telemedicine became crucial tools for delivering care to pregnant women during the COVID-19 pandemic by facilitating and ensuring continuity of care. Approximately 77.9% of expectant mothers used pregnancy-related mobile applications (Özkan Şat & Yaman Sözbir, 2021; Chardalias et al., 2022). The digital platforms provided several services for pregnant women, such as nursing monitoring, telephone appointments, and personalized health support. Education was delivered

through various channels, including video to teach prenatal exercises and relaxation techniques to release tension (Iravani et al., 2023) and the use of WhatsApp or telephone platforms to increase knowledge to pregnant women regarding pregnancy complications and COVID-19 prevention methods (Iravani et al., 2023; Shahri et al., 2024; Kia et al., 2023; Anokwuru & Mavis, 2022). Furthermore, telemedicine and online education facilitated training and counseling sessions, encompassing online educational sessions and counseling services for pregnant women during the COVID-19 pandemic that addressed routine care for pregnant women. (Kia et al., 2023; Marvi et al., 2023; Khademhosseini et al., 2024; Shahri et al., 2024). Integrating these digital solutions helped overcome barriers such as transportation limitations and social distancing requirements while maintaining the continuity of essential prenatal nursing interventions.

Resilience and psychosocial support

Mental health support became an essential aspect of pregnant women's treatment during the COVID-19 pandemic, specifically the increased anxiety and fear of infection. Nurses provide resilience and

psychosocial support for the mental health of pregnant women because of fear of contracting COVID-19 through several telemedicine platforms (Anokwuru & Mavis, 2022). Telemedicine-based interventions, including online counseling, virtual support groups, and several meditation programs, enhanced the resilience of pregnant women (Iravani et al., 2023; Anokwuru & Mavis, 2022; Marvi et al., 2023; Khademhosseini et al., 2024). These methods were the critical role of psychological support and virtual tools in maintaining pregnant women's resilience during the pandemic (Iravani et al., 2023; Khademhosseini et al., 2024). Meanwhile, smartphone-based self-care education improved awareness in at-risk women and increased qualitative insights into digital technology use and emotional experiences, including stress management, anxiety reduction strategies, and peer support groups (Shahri et al., 2024; Silva et al., 2023). Pregnant women had insufficient public transportation, inadequate social support, and limited access to up-to-date COVID-19 information, which contributed to increased stress and complications (Shahri et al., 2024; Silva et al., 2023; Iravani et al., 2023). Meanwhile, an innovation was the inclusion of spouse-focused telemedicine training programs, which strengthened family support systems and significantly improved pregnant women's emotional well-being by enabling partners to provide more informed and effective support during pregnancy (Marvi et al., 2023; Khademhosseini et al., 2024).

Discussion

Digital technologies have highlighted that telemedicine and mobile health applications serve as integrated tools for physical and psychosocial health support in maintaining pregnant women's healthcare in the community throughout the COVID-19 pandemic. The nursing care model offered critical information to pregnant women, resulting in notable decreases in health anxiety and stress levels. The finding indicated that mobile platform programs such as telemedicine, mobile applications, and video clips have significantly increased maternal awareness and improved health outcomes by providing ongoing support and healthcare guidance from a distance (Iravani et al., 2023; Shahri et al., 2024). The nursing

implementation of digital solutions suggests that incorporating telehealth into maternal care systems can enhance service accessibility and resilience, particularly in times of health crisis or pandemic (Marvi et al., 2023; Özkan Şat & Yaman Sözbir, 2021; Tan et al., 2023). The integration of these digital solutions demonstrated lasting benefits beyond immediate healthcare delivery, establishing new models for accessible maternal care during crisis situations (Tan et al., 2023). However, the implementation faced practical challenges, including digital literacy barriers and internet accessibility issues, particularly affecting underserved pregnant women in the community.

The psychological impact of these digital interventions was particularly significant: the complex emotional needs of pregnant women in the community throughout the pandemic. Telemedicine interventions, including telemedicine and online educational activities, offered essential emotional and mental health support, opposing feelings of loneliness and anxiety (Marvi et al., 2023; Silva et al., 2023). The services responded to the sensitive feelings of isolation and anxiety from restricted in-person healthcare interactions, supporting pregnant women in preserving their psychological well-being and navigating new challenges (Marvi et al., 2023; Silva et al., 2023; Iravani et al., 2023; Shahri et al., 2024). These interventions created sustainable support systems through online educational sessions and interactive support communities, helping women develop long-term coping strategies (Iravani et al., 2023; Shahri et al., 2024). The success of these digital mental health initiatives has established a framework for future interventions, suggesting the potential for hybrid models that combine virtual support to enhance pregnant women's community resilience beyond the pandemic period.

Implications

For healthcare practice, healthcare providers should integrate digital health platforms into standard pregnant women in community intervention protocols, combining virtual and in-person services. For policy, standardized guidelines and distribution resources for digital infrastructure for telemedicine implementation should be developed for pregnant women in the community. For healthcare systems, virtual support groups and digital literacy programs

should be established to support sustainable pregnant women in the community.

Conclusions

An integrated approach combining telehealth and targeted psychosocial interventions is essential for comprehensive maternal care during health crises It should include digital platforms for health monitoring, virtual support groups, and online educational resources to ensure pregnant women in the community receive holistic care during a pandemic. Insufficient information and social support underscore the necessity for structured communication channels and public health systems to assist pregnant women. Healthcare systems should prioritize the development of sustainable digital health solutions that combine virtual interventions with traditional community support services. This includes implementing standardized telehealth protocols, establishing virtual support networks, and integrating mobile health applications into pregnant women's care. Therefore, telemedicine should be integrated with health education and psychological intervention in community health services to reduce risks and ensure continuing support for pregnant women in the community.

Ethics

Research Ethics Committee approval was not required for this study.

Limitations

The review may have missed relevant studies due to limitations in database selection and search strategy.

Recommendations for Future Research

The next study should assess the cost-effectiveness of various digital health solutions and explore barriers to digital health adoption by pregnant women and families in the community.

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