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REVIEW

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Stress Coping Strategies of Pregnant Women during COVID-19 Pandemic: a Literature Review

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ABSTRACT

Background: *It is widely recognized that the COVID-19 pandemic has adversely affected the psychological well-being of pregnant and postpartum women. Consequently, it is of the utmost importance to identify effective strategies that can mitigate the negative emotional experiences of pregnant women during any pandemic period.*

Aim: *This review seeks to identify the most effective approaches to managing stress among pregnant women during the COVID-19 pandemic and emphasizes the significance of providing support to pregnant women throughout this period.*

Methods: *A comprehensive literature review was conducted, and studies that met the inclusion criteria were analysed. The primary criterion was that the studies examined strategies employed by pregnant women to cope with stress during the COVID-19 pandemic.*

Results: *A total of 16 studies were included in the analysis. Adaptive coping strategies were found to be more effective in ameliorating the impact of the pandemic on mental health compared to dysfunctional coping strategies. While pregnant women generally exhibited maladaptive coping behaviours, psychological support and promoting beneficial coping strategies were the most frequently described methods for improving their mental health during the pandemic and preventing adverse outcomes of pregnancy. Additionally, avoiding misinformation and seeking social and family support were considered essential components of effective support.*

Conclusion: *It is crucial to prioritize psychological, emotional and mental health support for pregnant women during the pandemic.*

Keywords: coping strategies, pandemic, pregnancy, COVID-19, mental health, healthcare.

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INTRODUCTION

The COVID-19 pandemic had a profoundly detrimental impact on healthcare systems, the global economy and the overall quality of life of the population (1, 2). The unprecedented changes that have occurred during this period of time have resulted in elevated rates of depression and anxiety among the general population (3, 5). It is well-established that pregnancy is a vulnerable period in terms of an individual's emotional and psychological well-being (6). Consequently, the pandemic has emerged as a significant risk factor for pregnant women, particularly in terms of psychological distress (7-10). During this time, pregnant women have experienced heightened levels of depression and anxiety (7-10).

The disruptions to their daily routines, work, social and family life have served as risk factors for anxiety and mood disorders among pregnant women (7-8). Furthermore, the alterations in healthcare systems, the implementation of new measures in hospitals and the limited information regarding SARS-CoV-2 infection and its potential impact on pregnancy and fetal development had a detrimental effect on their mental health (11, 12). The threats posed by the pandemic to both their lives and the health of their unborn child have been associated with negative emotional responses, leading to elevated rates of anxiety (7-12).

A particularly concerning psychological impact has been observed among women who have contracted SARS-CoV-2 during pregnancy due to their heightened concerns about their own health and the potential adverse effects on their pregnancy outcome (7-12). Additionally, the decision to receive vaccination against SARS-CoV-2 during pregnancy has been a source of stress for women, primarily due to the limited data on its safety and efficacy, as well as the dissemination of misinformation regarding adverse events associated with the vaccine on social media platforms (13).

It is well-documented that stress during pregnancy can have adverse consequences, including maternal disorders, premature birth and lower birth weight (14-17).

Therefore, it is imperative that measures be implemented to mitigate the negative emotional impact experienced by pregnant women during the COVID-19 pandemic. The primary objective of this literature review was to identify the most effective strategies that can assist pregnant women in coping with the adverse aspects of the pandemic. ❑

MATERIAL AND METHOD

A systematic review was conducted to identify the most effective strategies for managing stress among pregnant women during the COVID-19 pandemic. The search was conducted in PubMed from January 2021 to December 2023, utilizing keywords and MeSH descriptor terms such as "pregnancy", "COVID-19", "pandemic", "stress", "anxiety" and "pregnant women". Additionally, the bibliographies of selected papers were manually reviewed for further relevant studies.

The primary objective of this review was to elucidate the most effective strategies for addressing stress among pregnant women during the COVID-19 pandemic and emphasize the significance of providing support for them during this period.

Inclusion and exclusion criteria

Studies that analyse the coping strategies of pregnant women during the pandemic and evaluate

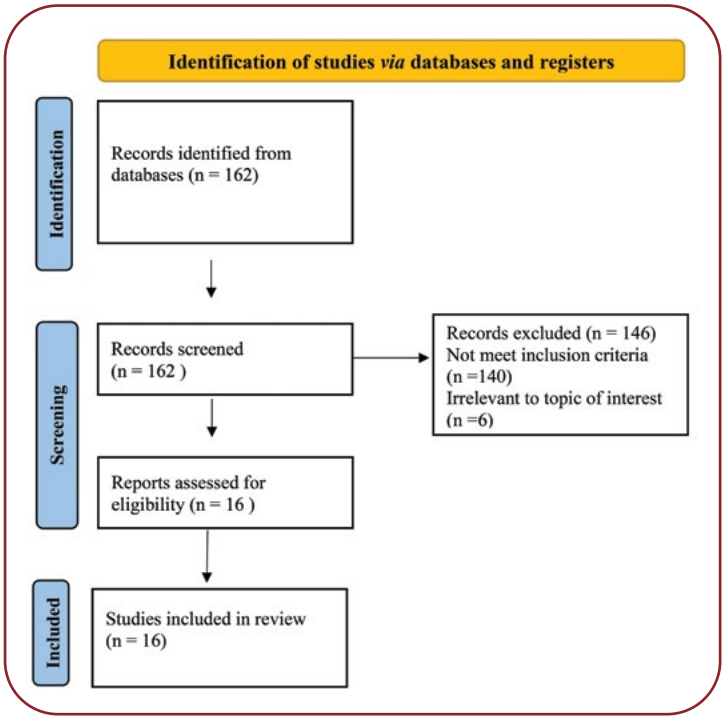

FIGURE 1. Prisma flowchart of information selection

the most effective measurements to minimize the negative mental health outcomes during the COVID-19 pandemic were included. No language restrictions were applied. Another inclusion criterion is represented by the publication period of the studies; this should correspond to the time frame established by us (from January 1, 2021, to December 31, 2023).

Case reports, observational studies, survey results, systematic and scoping reviews and meta-analyses were included. Editorials, letters and commentaries that did not contain relevant evidence were excluded.

A total of 162 articles were identified during the initial search. After a first assessment for eligibility, 146 studies were excluded because they did not address solutions for stress coping. We selected 16 studies for our review.

We used Prisma flow chart to illustrate the selection process (Figure 1).

Our primary objective was to identify the most effective coping strategies employed by pregnant women during the pandemic to minimize the risk of developing depression or anxiety.

RESULTS

Table 1 presents the pertinent study characteristics of the included papers. These characteristics encompass country of origin, population size, number of participants, study design and primary findings. ❑

TABLE 1. Studies that analyse the coping strategies employed by pregnant women during the COVID-19 pandemic and evaluate the most effective measures to minimize the adverse mental health outcomes experienced by them during the pandemic

Authors and publication year	Country of origin	Participants	Study design	Measurements to help pregnant women adopting beneficial coping strategies
Timircan *et al*, 2021 (19)	Romania	304 pregnant women	Cross-sectional design	Psychological, emotional and mental health support for pregnant women during pandemic
Puertas-Gonzalez *et al*, 2021 (20)	Spain	16 pregnant women	Feasibility study	Online cognitive behavioural intervention may be effective in pregnant women.
Kilic *et al*, 2022 (21)	Turkey	149 pregnant women	Cross-sectional design	Correct information offered by specialists, appropriate focused coping styles (*i.e.*, positive reinterpretation) and especially family social support for pregnant women; Reduce social contact at work in high-risk pregnancies, giving rest leave when necessary and remedial interventions for sleep problems.
Davis *et al*, 2021 (22)	Australia	174 perinatal women	Explanatory sequential design	Resilience traits and positive mindsets, meditation-based or similar training.
Moulaei *et al*, 2021 (23)	Iran	15 obstetricians and 15 pregnant women	Descriptive-applied design	A mobile-based self-care application for pregnant women to provide various services to reduce maternal anxiety and stress about COVID-19, allow quick diagnosis of COVID-19, reduce the possibility of infection, provide rapid access to reliable answers for possible questions, identify high-risk locations, provide pregnant women with instant access to COVID-19 healthcare centres and information about coronavirus, and explain selfcare and self-management processes.
Kinser *et al*, 2021 (24)	Virginia, USA	524 pregnant and postpartum women	Cross-sectional online observational design	Psychological intervention. Social media can be used as a social support tool rather than an anxiety contagion mechanism.
Puertas-Gonzalez *et al*, 2022 (25)	Spain	207 pregnant women	Randomised controlled trial	Online cognitive-behavioural intervention for pregnant women during the COVID-19 pandemic
Wahyuni *et al*, 2021 (26)	Indonesia	99 pregnant women	Cross-sectional design	Promoting active coping style: self-efficacy of pregnant women or the belief that they are able to deal with stressors during the Covid-19 pandemic: mothers motivate themselves in dealing with pregnancy, childbirth and changing their roles because self-efficacy is a link between information and action. The harmony between motivation and action will create positive behaviour.
Monteiro *et al*, 2022 (27)	Portugal	207 pregnant women	Cross-sectional design	Promoting self-compassion and mindful self-care practices.
Craig *et al*, 2021 (28)	Italy	1179 pregnant women	Cross-sectional design	Promote a positive prenatal attachment, such as foetal movement counting, touching the belly, and talking to the foetus; mindfulness-based prenatal programs; adequate and functional perception of COVID-19; enhanced sensitization and health education sessions.
Anderson *et al*, 2021 (29)	USA	60 perinatal women	Randomised controlled trial	Maintaining social connections and spending time outdoors in nature.
Wheeler *et al*, 2021 (30)	USA	33 pregnant women	Prospective, longitudinal, cohort study	Appropriate assessment, intervention and education of patients and members of this community; public health and maternal-child nurses alike should ensure clear communication of government-mandated and scientifically supported best practices.
Khoury *et al*, 2021 (31)	Canada	304 pregnant women	Cross-sectional design	Psychological support of pregnant women in coping with stress during COVID-19 pandemic, promoting adaptive coping strategies.
Firouzbakht *et al*, 2022 (32)	Iran	318 pregnant women	Cross-sectional design	Screening for depression at least once during pregnancy Training for stress coping using beneficial methods
Demircan *et al*, 2021 (33)	Turkey	304 pregnant women	Cross-sectional design	Correct medical information and evidence-based information about SARS-CoV-2 infection and COVID disease from health professionals
Chen *et al*, 2022 (34)	China	1160 pregnant women	Cross-sectional design	Psychological care

DISCUSSIONS

Stressors

During the onset of the pandemic, isolation was the initial recommendation of authorities. This was associated with alterations in customary life routines, reduced social interactions and physical distancing from others (8). Prenatal and postnatal care was adversely affected, medical consultations were postponed to prevent the spread of the virus and telemedicine emerged as a viable alternative (8). Numerous healthcare services were implemented, resulting in the adoption of new medical guidelines and the transformation of healthcare infrastructure. Restrictions were imposed on hospital visits and the presence of birthing partners (8, 35).

Apart from these measures, fear of infection, inadequate basic supplies, insufficient information and unclear instructions on how to proceed contributed to the emotional distress experienced by pregnant women (7-10, 24, 31). The apprehension regarding the potential harm to the fetus due to the virus transmission was a significant negative sentiment among this category of population (19, 21, 30).

Given the heightened emotional and psychological vulnerability of pregnant women, the pandemic-induced changes posed a substantial risk factor for the elevated incidence of depression and anxiety during pregnancy. Numerous studies have established a correlation between mental health impairment during pregnancy and adverse pregnancy outcomes, such as low birth weight and premature labour (16). Furthermore, both prenatal and postpartum depression have been associated with breastfeeding difficulties (19, 21, 28). The findings of Timircan *et al* suggested that women who contracted COVID-19 during the pandemic experienced physical damage and subsequently experienced detrimental impacts on their mental well-being (19).

In general, pregnant individuals with COVID-19 do not exhibit significantly more severe disease symptoms compared to non-pregnant individuals. The majority of cases among pregnant women are asymptomatic or mildly symptomatic (36). Some research suggests that only pregnant patients with associated pathology are at risk of developing severe forms of the disease (36, 38). Regarding pregnancy outcomes, preterm delivery, low birth weight and birth *via* caesarean section (CS) were commonly observed (36). However, the data is uncertain and constantly evolving, which presented a significant stressor for women. Despite the knowledge that vaginal birth does not increase the risk of virus transmission, the rate of CS deliveries increased (36). Furthermore, there is no scientific evidence supporting the vertical transmission of SARS-CoV-2. Additionally, the possibility of transmission of SARS-CoV-2 through breast milk remains unclear (36).

It has been established that the COVID-19 pandemic had a detrimental impact on the psychological well-being of pregnant and postpartum women (37). This period has had a negative influence on pregnant women due to changes in healthcare systems and social life (8, 36). The uncertainty surrounding the pandemic has been a major source of anxiety. The limited information available about SARS-CoV-2 infection has led to heightened concerns about personal health, particularly regarding pregnancy outcomes (38).

Multiple studies have demonstrated an increased prevalence of depression and anxiety among mothers during the COVID-19 pandemic (7, 39-46). Mei H *et al* evaluate depression, anxiety and stress among pregnant women during the pandemic compared to non-pandemic periods (47). They observed that depression rates were much higher during pandemic (10.36% *vs*. 0.55%) and no significand difference in anxiety rates (47). Instead, the stress symptoms were more common among pregnant women before the pandemic (69.39% *vs*. 60.45%) (47).

Furthermore, it is well-established that stress during pregnancy can have adverse effects on pregnancy outcomes and the physiological and behavioural development of children (14-17). Therefore, it is imperative that during medical crises, pregnant women be prioritized in healthcare delivery (37).

Consequences of depression during pregnancy

Prenatal depression can have significant repercussions for both the mother and the fetus. Some of the consequences associated with prenatal depression include slower fetal development, abortion, low birth weight, preterm labour, preterm birth, maternal anemia and diabetes, hypertensive disorders (including preeclampsia), CS and postpartum depression (14-17, 48). Infants born to mothers experiencing prenatal de-

pression exhibit increased irritability, decreased activity and a higher likelihood of developmental delays. Furthermore, prenatal depression elevates the risk of postpartum depression and the infant's health and growth may be adversely affected if the mother experiences depression for an extended period. Despite the severe consequences of prenatal depression and the potential for effective screening and treatment to mitigate adverse birth outcomes, most research has focused exclusively on postpartum depression (14-17, 48).

Coping strategies

The identified papers emphasized the necessity of diverse coping strategies to support pregnant women during the pandemic. Most articles highlighted the addition of psychological and emotional support to the care of pregnant women (19, 24, 28-32, 34).

Various standardized questionnaires were employed to assess stress levels and identify stressors during this period and coping strategies. Additionally, the coping strategies adopted by pregnant women to manage stress were categorized as adaptive (active coping, positive interpretation, planning, acceptance) or maladaptive (avoidance, denial, substance use). The Coping Orientation to Problems Experienced Inventory scale (COPE) and Brief COPE were among the questionnaires utilized to evaluate pregnant women's coping strategies (19, 31, 32).

Timircan *et al* observed that maladaptive coping mechanisms were prevalent among pregnant women, particularly those infected with SARS-CoV-2 during pregnancy (19). Khoury *et al* conclude that dysfunctional coping and emotion-focused coping mediate the associations between COVID-19 experience and mental health outcomes in pregnancy (31). While maladaptive coping may provide temporary relief from mental health impacts, its long-term effects on pregnant women remain uncertain (31, 32). Concurrently, some studies have indicated that pregnant women employed avoidance as a coping strategy during the pandemic, which has been associated with depression (30, 32).

It is suggested that adaptive, problem-focused coping strategies are more effective in mitigating the psychological impact of the pandemic on mental health compared to dysfunctional coping strategies (21, 24, 28-32). Positive mental attitudes, meditation, self-compassion and mindful self-care practices have been demonstrated to be beneficial for pregnant women in reducing anxiety and stress related to COVID-19 (22, 26, 27). Furthermore, family support, maintaining social connections and spending time in nature are more effective than maladaptive strategies in decreasing stress during the pandemic (21, 29). Puertas-Gonzalez *et al* supported the efficacy of online cognitive-behavioural interventions in reducing anxiety among pregnant women (20, 25).

It is crucial for pregnant women and their families to receive accurate and evidence-based information about SARS-CoV-2 infection and COVID-19 from healthcare professionals. This ensures the minimization of misinformation disseminated through social media (21, 30, 33). Medical education for patients can also contribute to reducing anxiety levels (30). In Iran, a mobile-based self-care application was introduced to provide various services, enabling pregnant women to manage their pandemic-related needs independently (23).

Therefore, psychological and emotional support for pregnant women is essential in coping with stress during the COVID-19 pandemic. This support can promote beneficial coping mechanisms and can have long-term protective effects on maternal mental and physical health (19, 21, 28-32, 34). Future research should explore the long-term implications of the pandemic on maternal mental and physical health and assess the potential long-term protective effects of coping strategies.

Results of coping strategies

Telehealth services – The COVID-19 pandemic catalysed the widespread adoption of telehealth services, enabling pregnant women to access essential support and counselling from the comfort of their homes; this remote accessibility proved particularly beneficial in managing mental health concerns during this challenging period (8, 23).

Social support networks – Access to social support networks, encompassing familial relationships, friendships and online communities, demonstrated a substantial role in mitigating feelings of isolation and anxiety (21, 29).

Impact on prenatal care – Some women experienced disruptions in their regular prenatal care schedule which resulted in increased stress

levels (8); nevertheless, healthcare providers demonstrated adaptability by providing virtual appointments, enabling continuity of care despite these challenges (8, 19, 49).

Emotional resilience – Many pregnant women demonstrated resilience, with some reporting a strengthened sense of purpose and connection to their baby; programs that promoted mindfulness and coping strategies were beneficial (22, 26, 27, 49).

Importance of information – Access to reliable and timely information regarding the impact of COVID-19 on pregnancy facilitated the reduction of anxiety and enhanced decision-making abilities (21, 23, 30, 33).

Increased awareness – The situation heightened awareness of the mental health needs of pregnant women, leading to initiatives aimed at providing better support and resources (19, 24, 28-32, 34, 49). ❑

CONCLUSIONS

During the COVID-19 pandemic, pregnant women primarily experienced heightened anxiety regarding their own well-being and the potential risks to their unborn child. The disruptions to their daily routines, coupled with the limited information available about SARS-CoV-2 infection and pregnancy, contributed to an increased level of stress.

Therefore, it is essential that we reflect on the pandemic's impact, particularly on pregnancy care. Pregnant women's concerns should be prioritized and addressed to alleviate the psychological and emotional toll of the crisis.

Identifying the risk factors associated with negative emotional responses among pregnant women during the pandemic is crucial. By doing so, we can develop effective strategies to limit the adverse effects on the psychological health of pregnant and postpartum women, including the long-term impact of maternal mental health on a child's development.

Psychological and emotional support, promoting adaptive coping strategies, is highly beneficial for pregnant women during the pandemic. Maladaptive coping strategies have been linked to depression, suggesting that active coping approaches can enhance their mental well-being and prevent negative outcomes of pregnancy. Additionally, avoiding misinformation and seeking social and family support are essential in preventing negative feelings during times of crisis.

In conclusion, it may be advantageous to implement standardized screening methods to identify pregnant women at risk of developing symptoms of depression and anxiety. This can then lead to the provision of targeted support during pregnancy and postpartum. The significance of psychological, emotional, and mental health support for pregnant women should be emphasized especially during pandemic episodes. ❑

Availability of data and materials: All information in this review was documented by relevant references.

Authors' contributions: R.-G.C. designed the review; R-G.C., L.-M.M. and R.B. performed the literature search, selection of articles; R.-G.C wrote the paper; G.P. reviewed, edited and supervised the manuscript; R.-G.C administrated the project. All authors read and approved the final manuscript.

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