

REVIEW ARTICLE

Preconception care to improve pregnancy outcomes in COVID-19 survival Women: A systematic review

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ABSTRACT:

Background: COVID-19 has had a dramatic and obvious influence on the mental health of women. Preconception care (PCC) has received a lot of attention as an alternate and supplementary strategy to combat the persistently poor pregnancy outcomes caused by Covid-19 worldwide. **Objective:** The purpose of the systematic review was to look for PCC interventions to help women have healthier pregnancies. **Method:** We searched PubMed, Medline, EmBase, the Cochrane library, and Google Scholar for the most recent studies on preconception treatment to enhance pregnancy outcomes in COVID-19 surviving women in March 2023 for this systematic review. The terms [preconception care] AND [pregnancy outcomes] AND [COVID-19 survival women] were used as search criteria. Only articles in the English language were included in searches. **Results:** 1215 duplicate articles were removed from all databases that had been searched after the original search. Moreover, after looking at their titles and abstracts, 1575 publications were dropped from the study. Based on the predetermined inclusion and exclusion criteria, the primary author and co-author examined and chose the remaining 860 articles. Twelve papers that were deemed to be eligible for this study were included. A total of 2983 people took part in the chosen study. Iran (n=3) has published the majority of the chosen studies, followed by the US (n=2), India (n=2), Vietnam (n=2), Ethiopia (n=1), the Netherlands (n=1), and the UK (n=1). **Conclusion:** Preconception treatment improved the birth outcomes, according to the findings. It may be established that women's pregnancy planning is the real source of the mental health issues.

KEYWORDS: Preconception care, Maternal health, Pregnancy outcomes, Mental health issues.

INTRODUCTION:

Many people's everyday lives have changed as a result of the COVID-19 pandemic, which has caused widespread lockdowns, job losses, and disruptions to healthcare services. This has led to extremely high levels

of anguish and mental health issues¹⁻⁴. The impacts on pregnant women's mental health, who are thought to be a sensitive demographic, can be exacerbated⁵⁻⁸. Because of the distinctive physiological and psychological changes throughout pregnancy, this is a difficult time⁹.

Due to the observed rise in anxiety among pregnant women for both their kids and their own health, Salehi, Rahimzadeh¹⁰ recommend that COVID-19 be taken into consideration as a factor that influences pregnant women's mental health. Similar to this, Sharifi-Heris, Moghasemi¹¹ point out that pregnant women are in the high-risk category for traumatic mental health effects during a pandemic because both the physiological and psychological changes associated with the transition to motherhood led to an increase in stress and anxiety. Pregnant women have been most affected by the epidemic, with confirmed higher rates of anxiety (34–42%), sadness (25–31%), and psychological distress (70%)^{12,13}. Pregnant women have experienced stress and worry about the health and well-being of their unborn child during the pandemic¹⁴, as well as the lack of perinatal medical care, feelings of uncertainty and unpreparedness for birth, and restricted access to social services or other forms of support¹⁵. Soliman, Elalem¹⁶ recommended that practicing relaxation techniques should form an important component and should be included routinely in the management of pregnancy induced hypertension. Whereas, Ramanadin, Chaudhari¹⁷ reported that planned teaching programme was effective in increasing knowledge of post test score of healthcare worker regarding identification of high risk pregnancy.

Preconception care (PCC) has received a lot of attention as a substitute and additional strategy to address the persistently poor pregnancy outcomes around the globe. Preconception care is described as "a combination of treatments that attempt to detect and address biological, behavioural, and social risks to a woman's health or pregnancy outcome via prevention and management" by the Centers for Disease Control and Prevention¹⁸. Maternal evaluation, immunisations, screening, and counselling are the four groups of treatments that make up the core components of preconception care, according to the American College of Obstetricians and Gynecologists and the American Academy of Pediatrics¹⁹.

The purpose of PCC is to enhance maternal and foetal pregnancy outcomes by promoting the health of women of reproductive age prior to conception. Although most women and doctors understand how important it is to improve their health before getting pregnant, time restrictions and the variety of activities that make up PCC are the main obstacles to its broad adoption²⁰. PCC include treatments designed to recognise and alter the behavioural, physiological, and social risks that affect men and/or women who are of reproductive age²¹⁻²³. By addressing the factors of poor pregnancy outcomes, such as mental health conditions, excessive alcohol use, smoking, poor nutrition, diabetes, and obesity, these treatments seek to enhance pregnancy outcomes as well as the health of mothers and newborns (Figure 1).

Preconception counselling, risk screening during this time, and education on the need of maintaining good health before getting pregnant are all PCC interventions.

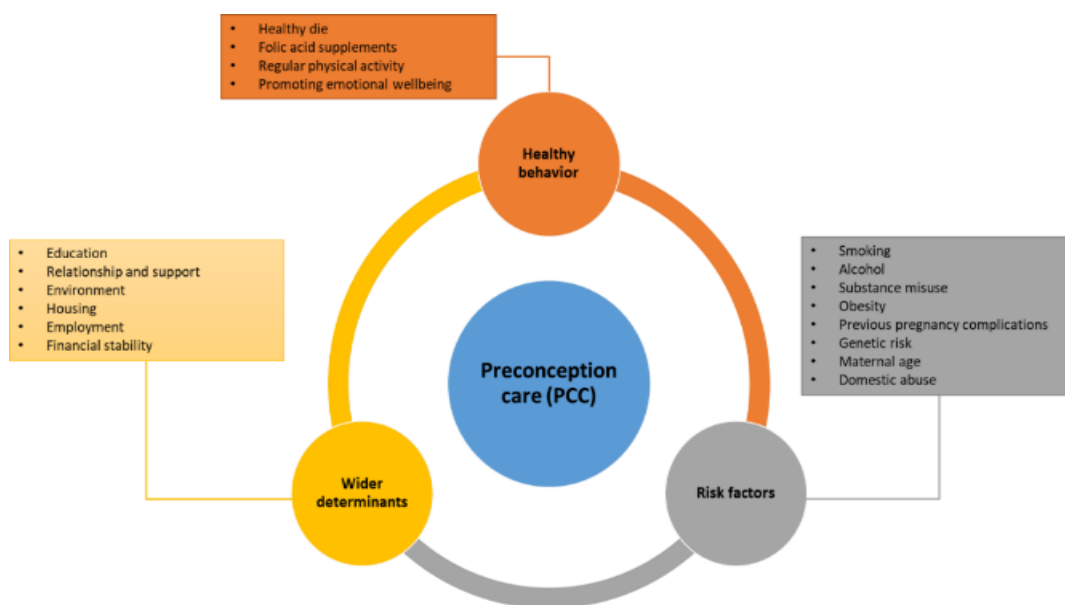


Figure 1: Preconception care and influencing factors in the health of mother and children. Source:Authors own development.

It has been demonstrated that PCC for all women, as well as women with specific risk factors, would enhance maternal and infant health over time^{24,25}. The preconception therapies that were mentioned were folic acid supplements, immunisations, lifestyle changes (appropriate diet and exercise, quitting smoking), and screening for the use of teratogenic drugs and chronic illnesses. Preterm delivery, low birth weight, congenital abnormalities, and intrauterine growth restriction are among conditions that these procedures have been demonstrated to either prevent or lessen the chance of. The objective of the systematic review was to examine PCC strategies to enhance pregnancy outcomes.

METHODS:

This study involves a systematic search for studies related to PCC interventions to help women have healthier pregnancies. For this systematic review in March 2023, we searched PubMed, Medline, EmBase, the Cochrane library, and Google Scholar for the most current research on preconception care to improve pregnancy outcomes in COVID-19 survival women. The terms [preconception care] AND [pregnancy outcomes] AND [COVID-19 survival women] were used as search criteria. Searches were restricted to English language articles only. The relevancy of the titles, abstracts, and keywords was checked by two independent reviewers.

Publications having titles or abstracts that complied with the requirements for this systematic review were chosen for a more thorough examination. To discover whether there were any other studies that were pertinent, we also went through the reference tracking of bibliographies and manual searches during the first search. The titles and abstracts were evaluated for inclusion by the writers independently. Only studies that satisfied the inclusion criteria were deemed eligible after being located utilizing the PRISMA technique and critical appraisal tools (<https://jbi.global/critical-appraisal-tools>) (Table 1).

The current study conforms with all advised research ethical standards. Because this study was a review of the findings of other previously published papers that were open to the public, the Research Ethics Committee did not officially approve it. The authors created a data collection form to gather information from the articles in an integrated manner. The initial author's name, the study's nation, the sample size, and the findings were among the characteristics that were taken from the research. Two writers separately extracted the data, and any disputes were settled by group discussion and agreement.

This study was approved by the Local Ethics Committee of Kazakhstan Medical University “KSPH” (study ID: 04-09-86715; date: 28/11/2022) with the exemption of informed consent

RESULTS:

Following the PRISMA guidelines and critical appraisal tools to ensure the quality and consistency of the identified articles, several criteria were used for article eligibility as described in Table 1. After the initial search, 1215 duplicate articles from all researched databases were deleted. Further, 1575 papers were removed from the research after their titles and abstracts were examined. The remaining 860 articles were reviewed and selected by the principal author and co-author based on the set inclusion and exclusion criteria. This study comprised 12 papers that were determined to be eligible.

A total of 2983 participants were involved in selected study. These studies have been published in various countries, involving various types of preconception care as presented in Table 2. Most of the selected studies have been published in Iran (n=3), followed by United States (n=2), India (n=2), Vietnam (n=2), Ethiopia (n=1), Netherlands (n=1) and United Kingdom (n=1). Different preconception care programs with their outcomes have been presented in Table 2

Table 1: Inclusion and exclusion criteria for studies

Inclusion criteria	Exclusion criteria
Studies on preconception care to improve pregnancy outcomes in COVID-19 survival women.	Anything not including the listed topics regarding preconception care.
Peer reviewed research with all types of study designs (such as quantitative, qualitative, and mixed methods)	Anything other than peer-reviewed articles and literature such as reviews, blogs, books chapters, websites content, and more.
English language research	Publications in languages other than English

Source: Author's development

Table 2: Characteristics of selected studies.

Author (year)	Country	Sample size	Preconception care	Outcomes
Setegn Alie, Alemu ²⁶	Ethiopia	624	Knowledge of preconception care	Utilization of the preconception care component was lower than that of the recommended service with various inequalities.
Maas, Poels ²⁷	Netherlands	1256	Lifestyle behaviors changes	The intervention had a modest favourable impact on prospective parents' lifestyle choices, primarily on the consumption of vegetables and the expertise of healthcare professionals. The findings of this

				study add to the body of knowledge on the effective application of PCC-interventions to improve the health of upcoming parents and future generations.
Swain, Begum ²⁸	India	782	preconception care with a standard maternal health care (MHC) program and an integrated MHC program (without preconception care)	The eligible couples will identify, accept, and put into practise the steps to enhance their preconception health through preconception care and counselling. Lastly, it is anticipated that improving maternal nutritional status and birth outcomes would be significantly influenced by maternal and paternal health.
Doke, Gothankar ²⁹	India	76	Focused group discussion	Women do not possess the information, practises, or services connected to PCC.
Flynn, Kavanagh ³⁰	United Kingdom	504	Pregnancy planning behaviors	The COVID-19 pandemic had an impact on women's pregnancy planning, since many of them delayed getting pregnant. These behavioural changes might have a significant influence on global health care systems as well as the health and welfare of pregnant women. To lessen the impact of upcoming epidemics or pandemics, family planning and fertility treatments should continue to be offered.
LeBlanc, Smith ³¹	United States	169	Behavioral weight loss intervention or usual care control.	Women's chance of going above the recommended gestational weight increase was unaffected by their participation in the prenatal weight loss strategy. Despite the intervention group's effective weight loss prior to conception, the intervention group was linked to a higher weight increase throughout the last trimester. Pre-pregnancy weight loss therapies may need to be paired with intense weight control that lasts until delivery to successfully reduce weight during pregnancy and enhance mother and child outcomes.
Upadhya, Psoter ³²	United states	383	Folic acid use	Pre/conception care given during paediatric visits has the potential to improve the health of women and the quality of births in subsequent pregnancies.
Azami, Nourizadeh ³³	Iran	70	Motivational interviewing on dietary intake and weight changes	Motivational interviewing is an effective weight-loss technique, and altering one's energy intake can help pregnant women who are obese or overweight protect themselves from the negative effects of their pregnancy.
Mirghafourvand, Babapour ³⁴	Iran	152	Preconception counselling	Preconception counselling was linked to a higher sense of internal control and a lower perception of stress. The impact of the couple's own habits and exposures on pregnancy and foetal outcomes should be emphasised by preconception counsellors as a possible strategy for reinforcing women's internal views.
Nourizadeh, Azami ³⁵	Iran	70	Motivational interviewing	Except for uncontrolled and emotional eating, motivational interviewing had a favourable impact on changes in eating and physical activity.
Nga, Quyen ³⁶	Vietnam	317	Nutrient-rich, food-based supplement	Given to rural Vietnamese women from preconception to term or mid-gestation to term, a nutrient-rich dietary supplement had no impact on maternal or newborn outcomes.
Quyen, Nga ³⁷	Vietnam	460	Food supplementation	Throughout the first two years of life, baby development was not improved by giving pregnant mothers a nutrient-dense, food-based supplement. Yet, throughout the first 24 months, the infant's weight-for-age Z-score (WAZ), length-for-age Z-score (LAZ), and weight-for-length Z-score (WLZ) were all positively correlated with mother height and prenatal weight increase.

Source: Author's development

DISCUSSION:

The absence of maternal education is one of the effects of the epidemic. In reality, physicians throughout the globe are worried that women lack the required preparation for childbirth and the period before, during, and following it³⁸. With this project, we wish to focus preconceptional assistance. The provision of PCC, a primary preventive strategy that attempts to involve women and couples of reproductive age before they become pregnant in a series of educational and managerial interventions that identify and reduce health risks, may enhance the health of women of reproductive age. Women had significant discomfort and mental

health issues during the COVID-19^{39,40}. Shayganfard, Mahdavi ⁴¹ established a link between mental health and changes in health behaviour by observing that pregnant women who had heightened health anxiety postponed or cancelled their regular medical appointments. A considerable decrease in the number of preconception healthcare visits was seen during Covid-19, according to Yadollahi, Zangeneh⁴². In order to improve mother and newborn health, previous systematic reviews recommend preconception care for all women as well as for those with particular risk factors such as obesity, diabetes, and hypertensive disorders^{25,43,44}.

Prior to becoming parents, preconception care works to make sure that couples have healthy lifestyles and have successful pregnancies⁴⁵. Women in remote regions, however, lacked understanding of preconception care. According to Doke, Gothankar²⁹ which was included in the current systematic review, women do not have the knowledge, habits, or access to services relevant to PCC. It is essential to carry out health education and promotion initiatives, become involved with couples' unique requirements, and evaluate their living conditions (family relationships, financial situation, etc.). Preconception care involves the aim of identifying and changing those risk factors that might impair maternal-fetal health, according to Upadhyaya, Jalazo⁴⁶.

The preconception care intervention comprised maternal screening, folic acid and iron supplements, immunisation, lifestyle changes, and counselling. Good preconception health can lead to better pregnancy and delivery outcomes, such as fewer low birth weight or preterm infants, congenital abnormalities, and intrauterine growth restriction^{47,48}. Maas, Poels²⁷ reported effective implementation of the PCC-intervention to improve the health of future generations and prospective parents in the present systematic study. Moreover, Swain, Begum²⁸ demonstrated that preconception treatment improved mother and paternal health. Preconception anaemia, specifically iron deficiency anaemia, was linked to a higher risk of low birth weight and foetal development limitation, according to a prospective research among Chinese women⁴⁹. Preconception care was less likely to be linked to low birth weight, preterm birth, maternal problems, and neonatal issues during delivery, according to Jourabchi, Sharif⁵⁰. Preconception care recipients also required fewer prenatal visits than those enrolled in the regular maternal health care programme.

Preconception care recommendations from the World Health Organization should include treatments that are applicable internationally, such as folic acid supplements and advice on quitting smoking and family planning^{51,52}. Recent systematic evaluations in this sector have shown that PCC treatments given in community and hospital settings are beneficial in improving pregnancy outcomes by lowering neural tube abnormalities⁵³, pre-eclampsia⁵⁴, abnormal birth weight⁵⁵, and preterm birth⁵⁶. Unfortunately, there is little proof that PCC treatments based on primary care are helpful in enhancing pregnancy outcomes^{21,57}. There is insufficient data to evaluate if PCC treatments are successful at improving pregnancy outcomes, according to a prior evaluation that looked into their use in primary care settings^{58,59}.

Preconception care decreases perinatal mortality and morbidity by simultaneously assessing the health of the woman and her partner and identifying the risk categories that are present in the community, allowing for intervention in those groups^{60,61}. Preconception care should therefore be given to both partners and women who want to avoid unintended pregnancies. This is because a woman's health status affects her own physical and mental health, the quality of her partner's sperm, how well they adjust to parenthood, and the health of their partner and children⁶⁰.

Strengths and Limitations:

This systematic literature review has several strengths, some of which include the thorough search for evidence, the criteria-based selection of significant information, the rigorous assessment of validity, the objective or quantitative summary, and the evidence-based judgements. There are various limitations to the study. Birth outcomes were self-reported and not validated by medical records because the data were gathered using online surveys. Further multi-method research including self-reported surveys and examination of medical records should be used to confirm these findings. More research needed in more varied samples.

CONCLUSION:

1. COVID-19 has had a significant and discernible impact on women's mental health.
2. Several women adjust their health practices as a result of the worry and anxiety the epidemic has caused.
3. It may be established that women's pregnancy planning is the real source of the mental health issues.
4. Preconception care is crucial for women and children to prevent birth-related problems in COVID-19 surviving women.
5. Further, multi-method research including self-reported surveys and inspection of medical records should be conducted.

CONFLICT OF INTEREST:

The authors have no conflicts of interest regarding this investigation.

ETHICAL STATEMENT:

This study was approved by the Local Ethics Committee of Kazakhstan Medical University "KSPH" (study ID: 04-09-86715; date: 28/11/2022) with the exemption of informed consent.

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