

The time is ripe: a scoping review of risk factors and barriers in preconception care

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Abstract

Purpose: Preconception care (PCC) is fundamental to preparing for a healthy pregnancy by reducing risk factors. However, there are still various obstacles to its implementation. This review aims to identify risk factors and barriers to accessing and implementing PCC. **Methods:** The research design used a scoping review compiled from articles obtained from four databases: PubMed, ScienceDirect, ProQuest, and Web of Science. The inclusion criteria include original articles published between 2020 and 2025 that are fully accessible, written in English, and reports on PCC risk factors and barriers. Exclusion criteria include theoretical articles without practical applications, research related to specific medical conditions, and articles that are not relevant to the research objectives. The selection process was conducted in accordance with the PRISMA-ScR (2020) guidelines. Data from selected articles were extracted and synthesized narratively in accordance with the Update Methodological Guidance for the Conduct of Scoping Reviews (2020). **Results:** A total of 896 articles were found in the search. After screening, 14 articles were selected for analysis. These articles represented eight countries, including Ethiopia, the United States of America, and Australia. Low PCC knowledge, poor obstetric history, and maternal age were the most frequently discussed risk factors for PCC. Meanwhile, barriers to PCC implementation were attributed to the lack of PCC guidelines and service standards, low PCC education and promotion, and low motivation and knowledge of healthcare workers. **Conclusion:** The implementation of PCC remains hindered by policy limitations, system readiness, and health worker capacity, underscoring the need for further research as a basis for developing comprehensive guidelines.

Keywords: preconception care; preconception health; pregnancy health; pregnancy planning; pregnancy preparation

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INTRODUCTION

Preconception care (PCC) is an intervention and service provided to individuals or couples before conception to optimize their health and well-being, ensuring both the mother and baby are in good condition [1]. Data from the World Health Organization

indicates that in 2023, there were 700 maternal deaths per day [2]. Additionally, in 2022, 2.3 million infants died within the first 28 days of life [3]. The high rates of morbidity and mortality among both mothers and children are closely linked to risk factors such as poor nutritional status, history of chronic diseases, and the mother's mental health issues that can impact fertility [4]. Therefore, PCC is conducted to improve health

status and reduce behavioral and environmental factors that may contribute to poor maternal and infant health outcomes, to improve pregnancy outcomes and future child health [5–10]. This type of care includes a series of interventions, including health promotion, risk assessment, and management of pre-existing conditions [11].

The Federation of Gynecology and Obstetrics recommends PCC as a service that supports good pregnancy planning [12]. In its implementation, PCC involves various health professionals such as doctors, nurses, midwives, pharmacists, and nutritionists who collaborate to provide comprehensive and optimal PCC services. These healthcare professionals play a role in conducting screenings, providing detailed counseling on risks, delivering essential care, and identifying treatments [13,14]. Additionally, to improve PCC services, innovations such as telemedicine have been developed to facilitate public access to preconception information [15]. However, in its implementation, PCC still faces challenges.

Common challenges include low awareness among reproductive-age women about accessing services and healthcare providers who are not adequately trained to provide PCC [16–18]. On the other hand, maternal health before pregnancy can determine pregnancy outcomes and the future health or development of the fetus. Poor health before pregnancy is associated with poor maternal and perinatal outcomes, such as preterm birth, low birth weight, congenital anomalies, and increased maternal morbidity and mortality [19–23].

The importance of PCC implementation remains a minor focus of attention, particularly for expectant mothers, despite various scientific studies demonstrating its benefits. In addition, existing research has focused more on clinical aspects or medical interventions during pregnancy and postpartum, while studies on risk factors and barriers in implementing PCC are still limited. This situation has led to a gap in knowledge and practice in the community, where most childbearing-age couples do not fully understand the importance of health preparation before conception. This scoping review aims to synthesize and identify the scientific literature on risk factors and barriers to accessing and implementing PCC.

METHODS

The design of this study is a scoping review to search and summarize the results of various scientific literature in answering the research question, “What are the preconception risk factors and barriers

experienced in implementing preconception care?”. In the process of development, the researchers used the Arksey and O’Malley framework, which consists of: (1) identifying the research question; (2) identifying relevant studies; (3) selecting studies; (4) mapping the data; and (5) collecting, summarizing, and reporting the research results [24].

Search strategies

The article search was conducted on four databases, PubMed, ScienceDirect, ProQuest, and Web of Science, from May 5th to 10th, 2025. To narrow down the search for relevant articles, the researchers used keyword combinations based on Medical Subject Headings (MeSH) (Table 1). The researchers established the following inclusion criteria: articles published between 2020 and 2025 that are fully and openly accessible, written in English, and original articles reporting on preconception risk factors and barriers to accessing preconception care. Additionally, the exclusion criteria applied were articles that discuss theory without practical application, articles on preconception care with specific medical conditions (such as gynecology, infertility, and chronic disease), and articles that were not relevant to the research objectives. To ensure that the articles obtained were suitable for answering the research questions, the researchers employed the Population, Concept, and Context scheme as follows: Population: individuals of childbearing age and preconception care providers; Concept: preconception care; Context: hospitals, communities, and primary healthcare services.

Table 1. Keywords in search

Databases	Keywords
PubMed	("preconception care"[Mesh] OR "preconception care" OR "pregnancy planning" OR "preconception counseling") AND ("risk factors" OR "risk factor" OR "determinant*" OR "predictor*") AND ("barriers" OR "challenge*" OR "obstacle*") AND ("health care" OR "healthcare" OR "health services")
ScienceDirect	("preconception care") AND ("risk factor") AND ("barrier" OR "challenge") AND ("health service")
ProQuest	("preconception care" OR "pregnancy planning") AND ("risk factor" OR "determinant") AND ("barrier" OR "challenge") AND ("primary care" OR "health service")
Web of Science	"preconception care" OR "preconception planning" OR "reproductive planning" AND "risk factor" OR determinant AND "barrier" OR "challenge" AND "health service"

Article screening was conducted using the PRISMA-ScR (2020) guidelines and Rayyan to ensure that the articles used presented the required information [25,26]. Three researchers (HZGP, W, EDH)

conducted the screening by verifying the duplication, inclusion, and exclusion criteria, as well as compliance with the PCC scheme. This process was carried out to ensure that all articles used were relevant to the research topic and to carefully identify the outcomes.

Quality appraisal

A quality appraisal was conducted to assess the reliability, quality, relevance, and validity of the articles used, aiming to minimize bias in decision-making [27]. The article quality assessment process was carried out by three researchers (HZGP, DPI, ASN) using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist (2020). The results of the critical appraisal were then discussed together to reach an agreement on the quality assessment of each article.

Data synthesis

Data synthesis was performed to group the data extraction results in accordance with the Update Methodological Guidance for the Conduct of Scoping Reviews [28]. All researchers extracted data, including article identity (author, year, aim, design, country of study, population, and results). Next, the researchers synthesized their findings by grouping the results of their identification into two main categories: 1) risk factors, and 2) barriers.

RESULTS

Search results

Based on the specified keywords, a total of 896 articles were identified across four databases: PubMed (30), ScienceDirect (233), ProQuest (296), and Web of Science (337). After checking for duplicate articles ($n = 67$), 829 articles remained for further analysis. Article screening was conducted by excluding articles published before 2020 ($n = 462$), review articles ($n = 88$), and articles that were not fully accessible ($n = 193$), leaving 86 articles. Furthermore, to ensure the suitability of the articles for the research objectives, the screening process was continued by excluding articles that did not discuss PCC implementation ($n = 39$) and articles that discussed PCC in specific medical conditions ($n = 33$). A total of 14 articles were selected for data extraction and synthesis in this review (Figure 1).

Risk of bias assessment

Risk of bias assessment was performed on seven cross-sectional (quantitative) articles and seven qualitative articles. All articles assessed were of good quality, allowing for further analysis with low risk of bias (Table 2).

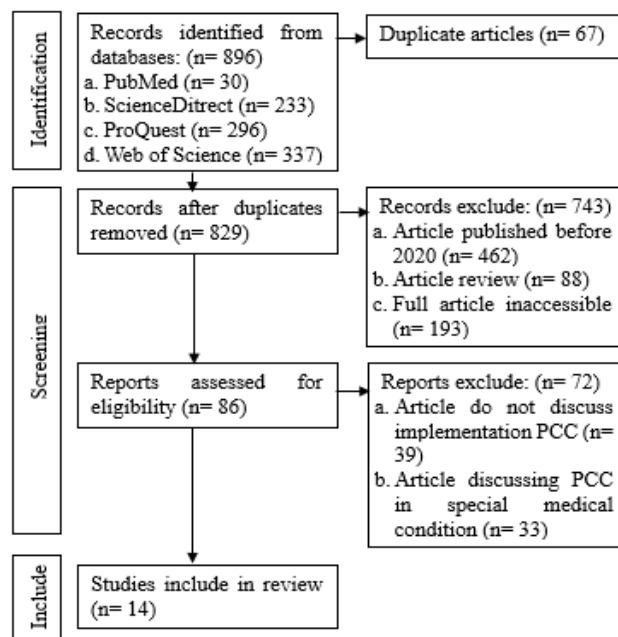


Figure 1. Article selection process

Table 2. JBI critical appraisal results

Article	Design	Assessment Result (%)
Ayele et al. (2022)	Cross-Sectional	8/8 (100)
Fetena et al. (2023)	Cross-Sectional	8/8 (100)
Setegn (2021)	Cross-Sectional	8/8 (100)
Du et al. (2021)	Cross-Sectional	8/8 (100)
Sori et al. (2021)	Cross-Sectional	8/8 (100)
Alkhatib et al. (2024)	Cross-Sectional	7/8 (87.5)
Mousa et al. (2021)	Cross-Sectional	7/8 (87.5)
Dorney et al. (2025)	Qualitative	10/10 (100)
Nacev et al. (2022)	Qualitative	10/10 (100)
Sardasht et al. (2022)	Qualitative	10/10 (100)
Clark & Mager (2022)	Qualitative	9/10 (90)
Lush et al. (2024)	Qualitative	9/10 (90)
Narendra et al. (2023)	Qualitative	8/10 (80)
McGowan et al. (2020)	Qualitative	8/10 (80)

Characteristic study

This study reviews 14 articles, comprising seven cross-sectional studies and seven qualitative studies (Table 3). The countries represented in the articles reported in this study include Ethiopia ($n = 4$), United States of America (USA) ($n = 2$), Australia ($n = 2$), Saudi Arabia ($n = 1$), Jordan ($n = 1$), United Kingdom (UK) ($n = 1$), China ($n = 1$), India ($n = 1$), and Iran ($n = 1$). The majority of the population involved were women of reproductive age (15–49 years). Other populations involved included men of reproductive age (18–45 years) and healthcare workers (doctors, nurses, midwives). Each of the reviewed articles highlights preconception risk factors that can affect the quality of pregnancy, conception outcomes, and their impact on maternal health. Additionally, some articles also identify barriers faced by the community and healthcare workers in accessing and implementing PCC services, particularly at the primary level (Table 3).

Table 3. Article extraction (n = 14)

Author (Year)	Aim	Design	Country	Population	Results
Ayele et al. (2022) [29]	Investigating PCC implementation and factors influencing it	Cross-sectional	Ethiopia	504 women aged 15–49 years	Women aged >30 years are more likely to access PCC, while multiparous women are less likely to utilize it.
Mousa et al. (2021) [30]	Assessing the level of knowledge, attitudes, and utilization of PCC	Cross-sectional	Saudi Arabia	386 women over the age of 18	Most respondents obtained information from sources other than health workers.
Setegn (2021) [31]	Understanding intentions and predictors in PCC use among women of reproductive age	Cross-sectional	Ethiopia	427 women of productive age (15–49 years)	Intention to access PCC increased among women who were able to overcome barriers, received support, had a positive outlook, and increased in age.
Sardasht et al. (2022) [32]	Determining quality, women's perspectives, and health service providers in PCC	Qualitative	Iran	25 Participants: 13 women of childbearing age and 12 midwives	The limitations of PCC services are caused by access barriers, quality of education, lack of awareness and referrals, high costs, and the motivation of health workers to focus on pregnancy services rather than pre-pregnancy.
Narendra et al. (2023) [33]	Exploring the challenges and opportunities of PCC implementation	Qualitative	India	Newly married women, newly married men, and family members (n=25)	Challenges to PCC implementation include social norms, low awareness, poor nutritional status, high workload, and women's minimal role in pregnancy decisions, while services still focus on post-pregnancy.
Fetena et al. (2023) [34]	Assessing the utilization of PCC and related factors among pregnant women	Cross-sectional	Ethiopia	393 pregnant women aged 15–49 years	The most frequently utilized services other than PCC were micronutrient supplementation, and the least frequently utilized was psychological health.
Lush et al. (2024) [35]	Exploring barriers, facilitators, and motivations in obtaining preconception health information	Qualitative	Australia	20 women	Most women relied more on social media and personal experience, with motivation to seek preconception information driven by concerns about the impact of age on fertility and infant health.
Clark & Mager (2022) [36]	Identifying essential health needs and determining strategies for providing health education and PCC	Qualitative	Uni States of America	19 women aged 20–44 years	Limited access, high costs, poverty, and lack of support affected women's access to maternal services; many respondents focused only on care during pregnancy, did not realize the importance of regular check-ups, and were reluctant to ask questions about their health conditions.
Du et al. (2021) [37]	Investigating factors associated with PCC utilization and its role in health behaviors of pregnant women and their partners before conception	Cross-sectional	China	948 pregnant women	The main reasons for not accessing PCC were unplanned pregnancies and satisfaction with public services; most sources of information were from the community and health workers; women >30 years were more likely to access PCC, while multiparous women were less likely to use it.
Sori et al. (2021) [38]	Determining the level of PCC knowledge and related factors among healthcare providers	Cross-sectional	Ethiopia	415 maternal health service providers (aged 20–40)	Most health workers lacked knowledge of PCC guidelines, particularly in chronic disease management, genetic counseling, screening, and fertility. However, higher education, work experience, access to guidelines, and PCC training contributed to better services.

Author (Year)	Aim	Design	Country	Population	Results
Nacev et al. (2022) [39]	Examining factors influencing the behavior of PCC service providers in outpatients	Qualitative	Uni State of America	8 family medicine doctors (4 obstetricians; 7 nurses; 1 midwife)	Many health workers are not familiar with the PCC guidelines, with limited interactions, low knowledge and motivation, and services that focus more on counseling than screening.
Alkhatib et al. (2024) [40]	Assessing knowledge, attitudes, and practices of PCC among women of reproductive age	Cross-sectional	Jordan	1,368 women of reproductive age (18-44 years old)	Urban, unmarried, highly educated respondents were more likely to have a positive attitude towards PCC, whereas a lack of health insurance was associated with poor PCC practices.
Dorney et al. (2025) [41]	Exploring PCC understanding among the productive age group	Qualitative	Australia	20 women and 5 men of productive age (18-41 years old)	There is an information gap on prepregnancy interventions in the productive age group.
McGowan et al. (2020) [42]	Exploring beliefs, knowledge, and attitudes toward preconception health among adults of childbearing age	Qualitative	United Kingdom	21 participants of fertile age (18-45 years): 7 men and 13 women	Men tended to be less aware of the importance of preconception health, with much more comfort consulting online, perceiving pregnancy preparation as a woman's responsibility, and perceiving visits to the doctor as valuable and applicable. However, all were aware of the importance of PCC but did not know how to do it.

Table 4. Findings on risk factors and barriers in PCC implementation

Topic	Findings
PCC risk factors	1. Low knowledge of PCC [29–32] 2. Malnutrition [33] 3. History of chronic disease [34] 4. Poor obstetric history [29,34] 5. Maternal age [29,31,34,35] 6. Low spousal support [35,36] 7. Unplanned pregnancy [37] 8. Low educational attainment [34]
Barriers to the implementation of PCC	1. Lack of guidelines and standards for PCC services [38,39] 2. Limited interaction time [39] 3. Insurance coverage [40] 4. Low motivation and knowledge among healthcare workers [38,39] 5. High healthcare costs [32,36] 6. Low education and promotion of PCC [32,41] 7. Focus of services on pregnant women [32,33] 8. Social norms in women's decision-making [33] 9. Perception that there is no need to visit a doctor for PCC [42] 10. Reliance on social media for information [35]

The following are findings related to risk factors and barriers in the implementation of PCC, as systematically analyzed in the reviewed articles (Table 4).

PCC risk factors

Nine articles reviewed in this study reported several PCC risk factors that may affect conception outcomes or obstetric quality (Table 4). Three commonly reported factors are low levels of knowledge about PCC [29–32], maternal age [29,31,34,35], poor obstetric history [29,34], and low spousal support in planning pregnancy and accessing preconception health services [35,36]. Other factors to consider include poor nutrition,

particularly among expectant mothers [33], the high incidence of unintended pregnancies [37], and low educational levels, which may limit exposure to information about preconception care [34].

Barriers to the implementation of PCC

PCC interventions still face numerous obstacles, including those related to systems, health workers, and the community (Table 4). Based on the articles reviewed, the barriers encountered include a lack of guidelines and standards for service delivery [38,39], limited interaction [38], services that remain focused on pregnant women [32,33], and a lack of understanding and motivation among healthcare

workers regarding PCC [38,39]. Additionally, barriers experienced include high healthcare costs and insurance coverage for accessing PCC [32,36,40]. In the community, barriers to implementing PCC are increasingly felt due to low education levels, social norms, the perception that visiting a doctor is unnecessary, and reliance on information from social media [32,33,35,41,42].

DISCUSSION

In an effort to improve maternal and child health, a community movement program was implemented in the form of PCC [43]. According to the findings, a lack of knowledge about PCC and poor nutrition remain major risk factors for suboptimal preconception conditions, especially in women, even though interventions at the primary care level, such as health education, dietary modifications, and medication, have been shown to help improve public understanding [29-33,44]. However, in its implementation, risk factors such as poverty, low education levels, and lack of social support remain barriers to accessing PCC [1]. These factors can reduce compliance levels and lead to unhealthy preconception behaviors. Other consequences of poor preconception behavior include an increased risk of obstetric complications such as hypertension, preterm birth, operative delivery, postpartum hemorrhage, and sepsis/chorioamnionitis [45]. Additionally, the rising incidence of fertility issues underscores the importance of implementing PCC [46].

A recent review study concluded three core recommendations for effective preconception counseling services, including Platforms, which are recommendations regarding the structure/scope of preconception services, core principles, which are essential recommendations for screening and management, and women's empowerment, which highlights the importance of empowering women to prepare for and decide on their pregnancies [47].

In addition to focusing on women's health, PCC principles should also consider men's health. There needs to be increased awareness of harmful reproductive behaviors and habits among men. The findings also confirm social norms in women's decision-making and the perception that it is unnecessary to visit a health worker for essential barriers that can hinder full partner involvement [33]. Preconception healthcare should include both partners as it contributes to preparing for a quality pregnancy [48]. PCC can help provide support for behavioral change and health promotion, such as modifying smoking behavior, alcohol consumption, illicit drug

use, and exposure to harmful chemicals, which increase the risk of miscarriage and congenital abnormalities [49-51].

The benefits of PCC are further enhanced by vaccination and preconception screening, which can prevent infectious diseases such as rubella, toxoplasmosis, and syphilis [52]. Additionally, PCC in women with micronutrient deficiencies before pregnancy can reduce congenital disabilities, infections in infants, and improve perinatal outcomes [53-55]. However, the findings indicate that limited promotion of PCC and low spousal support remain common psychosocial barriers [32,35-36,41]. On the other hand, the implementation of PCC can be optimal if it addresses not only physiological factors but also psychosocial and mental health factors that can lead to pregnancy complications [56,57]. Social support from partners and families can enhance mothers' emotional readiness [58]. However, it is worth noting that individuals' perceptions and involvement in PCC are also influenced by specific beliefs, norms, and cultural practices [1]. If not considered, this can become a barrier to achieving optimal PCC.

The challenges faced in implementing PCC are closely tied to the unpreparedness of the healthcare system and the lack of policies related to PCC [59]. This is reinforced by findings that identify a lack of understanding of PCC guidelines, low motivation and knowledge among health workers, and limited time for interaction with patients as the main systemic barriers [38,39]. Therefore, there is a need to enhance awareness, develop guidelines, and strengthen strategies that emphasize PCC as a fundamental primary healthcare service [60]. On the other hand, healthcare workers involved in PCC must possess a good knowledge and skills to develop interventions that align with existing cultural norms and values, thereby integrating PCC into healthcare services already accessed by the community [61]. Additionally, an inclusive, personalized, flexible, and patient-centered approach, combined with interprofessional collaboration, makes PCC an accessible and equitable service [13]. This will help expand the benefits of PCC, especially for high-risk groups, by improving well-being and optimizing health status [62].

This study confirms that the implementation of PCC is influenced by risk factors and barriers that encompass clinical, social, cultural, and health system aspects. These findings fill a gap in previous research, which focused more on pregnancy and postpartum periods. The results provide a basis for developing more comprehensive and contextual preconception service policies and practices.

CONCLUSION

Preconception care (PCC) is an essential basic health service. However, its implementation still faces several crucial obstacles, including policy limitations, the unpreparedness of the health system, and a lack of knowledge and skills among health workers. These obstacles are major barriers to optimizing PCC and need to be addressed systematically so that its benefits can be widely achieved. Further research is needed to explore the perceptions and experiences of healthcare workers, which can serve as a basis for developing more comprehensive and context-specific guidelines for implementing PCC.

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