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Impact of social determinants on preconception care utilization: A comparative review

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Abstract

Preconception Care (PCC) improves maternal and neonatal health by addressing risks before conception such as unplanned pregnancies, nutritional deficiencies. Despite its benefits, PCC use remains low worldwide and is shaped by diverse social determinants that vary across geographic, socioeconomic, and health system contexts. This review compares these factors in developed and developing countries. A PRISMA based comparative review of literature on January 2020 until April 2025 from Scopus, PubMed, and Science Direct identified 9,766 articles. After screening, 22 studies met the inclusion criteria, analyzing social determinants influencing PCC use among women of reproductive age in developed and developing countries. Across developed and developing countries, education and socioeconomic status are key determinants shaping women's knowledge, attitudes, and behaviors toward PCC. In developing countries, low awareness is linked to rural residence, limited decision-making power, and poor health literacy. In developed countries, barriers are mainly systemic, including insufficient provider training, fragmented services, and the absence of standardized PCC policies. Social determinants significantly impact PCC utilization and by recognizing the differences between developed and developing countries, appropriate context-specific interventions can be formulated to enhance PCC utilization for both resource-limited and high-income settings.

Keywords: Preconception Care (PCC), Impact, Utilization, Developed, Developing

Introduction

Preconception Care (PCC) has emerged as a pivotal intervention in maternal and child health by addressing modifiable risk factors prior to conception. The period before pregnancy provides a unique window of opportunity to optimize women's health and prevent future obstetric complications. Scientific evidence consistently demonstrates that comprehensive PCC is associated with a reduced incidence of Gestational Diabetes Mellitus (GDM), maternal obesity, hypertensive disorders of pregnancy, and adverse perinatal outcomes such as preterm birth, intrauterine growth restriction, and low birth weight.[1–4] Moreover, preconception interventions such as nutritional counseling and folic acid supplementation have shown significant effects in preventing neural tube defects and improving fetal neurodevelopment. Thus, PCC not only promotes maternal well-being but also exerts long-term protective effects on neonatal and childhood health outcomes.

Globally, the burden of maternal and neonatal morbidity remains substantial. The maternal mortality ratio accounts for about 40% worldwide, while neonatal deaths have decreased by 44% between 2000 and 2022. This challenge is particularly evident in developing countries, where preventable causes such as unplanned pregnancies, nutritional deficiencies, poorly controlled chronic diseases, and inadequate early antenatal care remain prevalent.[5,6] Many of these conditions could be effectively mitigated through the implementation of PCC strategies.[1,7] PCC has been shown to reduce the incidence of maternal obesity by 73% compared to those without preconception services, and the proportion of pregnant women with GDM is lower in the PCC intervention group (41.2%) than in the non-PCC group (50.4%).[8] Despite such compelling evidence, the adoption and implementation of PCC remain inconsistent across regions. In developed countries, PCC coverage is often hindered by fragmented healthcare systems and lack of integration into routine practice, while in developing countries, barriers such as limited healthcare infrastructure, low health literacy, and sociocultural constraints impede accessibility.[3,9] This global

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disparity underscores the need to re-evaluate the determinants influencing PCC utilization in diverse contexts.

The complexity of PCC utilization is influenced by multiple interrelated determinants spanning individual, community, and systemic levels. Previous research indicates that factors such as a woman's educational background, socioeconomic status, knowledge of PCC, cultural beliefs, and prior obstetric experience significantly affect engagement with preconception services.[1,10] In addition, the availability of trained healthcare professionals, public awareness initiatives, and male partner support further influence PCC utilization.[2,7] These factors often interact in nonlinear and context-specific ways, suggesting the importance of comprehensive analysis across different geographic and socioeconomic settings.

Considering these challenges, it becomes imperative to explore and comprehend the social determinants that influence women's engagement with Preconception Care (PCC), whether as enabling or inhibiting factors, especially across different health system settings in developed and developing nations. A thorough understanding of these determinants is fundamental to formulating effective, evidence-driven interventions that are responsive to specific sociocultural and structural conditions. The significance of this study lies in its potential to advance global health outcomes by decreasing maternal morbidity and mortality, fostering reproductive health equity, and supporting the achievement of Sustainable Development Goals (SDGs) related to maternal and child health.

Despite the growing body of evidence supporting the effectiveness of Preconception Care (PCC) in improving maternal and neonatal outcomes, there remains a significant gap in understanding the social and systemic determinants that influence its utilization. Most existing studies have primarily focused on the clinical impacts of PCC, while limited attention has been given to the underlying sociocultural, economic, and structural barriers that affect women's access to and engagement with such services. Furthermore, disparities between developed and developing countries highlight the need for a comparative analysis to identify the most influential factors shaping PCC utilization across different contexts. Addressing these gaps is essential to developing targeted, evidence-based strategies that can enhance the accessibility, quality, and integration of PCC into global health systems.

This study aims to systematically explore the social determinants influencing women's utilization of PCC in both developed and developing countries, to identify the key factors that shape service uptake, and to determine which determinants can be improved to enhance the accessibility and effectiveness of PCC services. By synthesizing recent empirical evidence, this study seeks to generate policy-relevant insights that can guide the design of context-sensitive, evidence-based strategies for improving PCC coverage and utilization worldwide.

Methods

Study design

This study employed a systematic comparative review guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. The methodological process adhered to the stages proposed by Arksey and O'Malley (2005) and refined by Levac et al. (2010), which include identifying the research question, identifying relevant studies, selecting studies, charting the data, and collating, summarizing, and reporting the results. The primary aim of this review was to compare the social determinants influencing women's utilization of Preconception Care (PCC) between developed and developing countries. The review covered literature published from January 2020 to April 2025.

Research subject

The target population in all included studies comprised women of reproductive age (15–49 years). These women were assessed based on their utilization, access, and engagement with Preconception Care (PCC) services, as well as the influence of various social determinants such as education level, socioeconomic status, place of residence (urban or rural), occupation, health literacy, cultural and gender norms, and the role of healthcare providers.

The sampling frame for this review was defined by

specific inclusion and exclusion criteria. The inclusion criteria encompassed original empirical studies (quantitative, qualitative, or mixed-methods) that examined social determinants influencing women's utilization of PCC, published between January 2020 and April 2025, conducted in either developed or developing countries, written in English, and available in full text. Studies were excluded if they were non-original articles (such as reviews, commentaries, or editorials), focused solely on women with specific pre-existing conditions (e.g., diabetes or epilepsy), or were published in non-English languages or without accessible full texts. Following the screening process, a total of 22 studies met the eligibility criteria—12 originating from developing countries and 10 from developed countries.

Data collection techniques

A comprehensive literature search was carried out across three major international databases—Scopus, PubMed, and Science Direct. The search strategy employed the Boolean formula: (Women OR Female OR Childbearing) AND (Preconception OR Preconceived) AND (Knowledge OR Belief OR Attitude OR Behavior OR Awareness) AND (Utilization OR Access OR Coverage OR Uptake), which was adapted to suit the indexing structures of each database.

In total, 9,766 records were identified: 3,174 from Scopus, 2,523 from PubMed, and 4,069 from Science Direct. After removing 8,642 duplicate records, 1,124 articles were screened based on titles and abstracts. Subsequently, 179 full-text articles were reviewed for eligibility, resulting in 22 studies that met the inclusion criteria. The screening process was independently conducted by two reviewers in three stages: (1) title and abstract screening, (2) full-text eligibility assessment, and (3) final inclusion based on study quality and relevance. Any disagreements between reviewers were resolved through consensus discussion.

For data extraction, a standardized extraction form was utilized to document essential study characteristics, including author(s), publication year, country, study design, population and sample characteristics, type of social determinant analyzed, and key findings or outcomes. Data extraction and verification were performed independently by both reviewers to ensure accuracy and consistency.

Data analysis

The data analysis employed a narrative synthesis combined with a thematic analysis approach. Descriptive Mapping included studies were organized based on two main criteria: (a) country classification between developed and developing countries, and (b) the type of social determinant investigated. Next Step is thematic categorization, through thematic analysis, several recurring patterns were identified across the studies, including education and socioeconomic disparities, provider-related barriers, cultural and gender-based influences, and system-level challenges such as policy gaps and service fragmentation. After thematic analysis is comparative synthesis were compared across developed and developing contexts to identify variations in the nature and level of influencing factors. The synthesis revealed that while education and socioeconomic status emerged as universal determinants of preconception care (PCC) utilization, systemic and institutional barriers were more prominent in high-income settings. In contrast, structural and access-related barriers were more prevalent in resource-limited countries.

This thematic synthesis ultimately facilitated the development of a comparative framework that illustrates the differing roles of social determinants in shaping women's utilization of PCC services across diverse socioeconomic contexts.

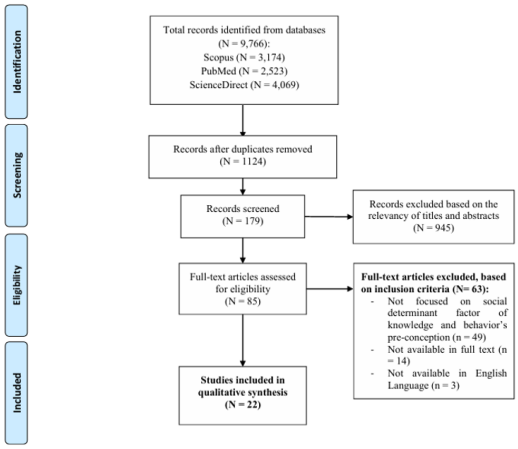

Figure 1. PRISMA flow chart

Replication guide

To replicate this study, researchers should utilize the same methodological framework and procedures. The literature search should be conducted using the same databases such as Scopus, PubMed, and ScienceDirect, limited to English language original studies published between January 2020 and April 2025. The same Boolean search string should be applied to ensure consistency in identifying relevant studies. The review process should follow the PRISMA workflow, encompassing the stages of identification, screening, eligibility, and inclusion. The systematic review structure should be guided by the frameworks proposed by Arksey and O'Malley (2005) and refined by Levac et al. (2010). Screening and data extraction must be performed independently by two reviewers to ensure objectivity and accuracy. Finally, the analysis should employ a narrative thematic synthesis approach to compare and interpret findings across developed and developing country contexts.

Results

A total of 22 studies that met the inclusion criteria were selected for this systematic review, with 12

studies originating from developing countries and 10 studies from developed countries. The studies employed a range of methodologies, including cross-sectional surveys (n=13), qualitative studies (n=8), one mixed-method study, and one retrospective cohort analysis. This diversity enabled both quantitative assessments of Preconception Care (PCC) uptake and qualitative insights into behavioral, cultural, and structural barriers. The majority of studies from developing countries employed cross-sectional designs, while those from developed countries predominantly utilized qualitative or mixed-method approaches. This discrepancy can be attributed to the advanced state of health systems in developed countries, which are better equipped to identify experiential and policy-level discrepancies.

In developing countries, the most frequently reported social determinants impacting PCC utilization were education, socioeconomic status, distance to health facilities, and cultural norms. For instance, studies from Ethiopia have repeatedly emphasized that low educational attainment and the absence of provider counseling represent significant barriers to the utilization of PCC.[11–13] Additionally, cultural and gender dynamics, such as male-dominated decision-making, have been observed in Malawi and Ethiopia.[14,15] Moreover, studies have consistently demonstrated that low health literacy and rural residence are associated with reduced awareness of and utilization of PCC. These factors are often further compounded by logistical challenges, including transportation difficulties and the fragmentation of services.

Studies conducted in developed countries, however, have placed greater emphasis on provider-related and systemic factors. The role of healthcare professionals in initiating PCC discussions was foundational in countries such as the Netherlands, Bulgaria, and Australia.[16–18] However, challenges such as inadequate provider training, fragmented care pathways, and the absence of standardized policy guidelines hindered the effective implementation of these discussions. Socioeconomic disparities persist among vulnerable subgroups, particularly within the U.S. context, where insurance coverage significantly impacts access to healthcare services.[19] Notably, younger women and those with planned pregnancies were more likely to seek PCC. Nonetheless, a considerable number of women have indicated that they did not receive adequate information or motivation from healthcare providers to initiate preconception consultations.

A limited number of studies have extended beyond the scope of access evaluation and have reported positive clinical outcomes associated with PCC uptake. For instance, study in Australia and Canada highlighted that women who accessed PCC were significantly less likely to experience pregnancy complications such as gestational diabetes, hypertensive disorders, and unplanned cesarean delivery.[20,21] These findings underscore the preventative potential of PCC when integrated effectively into routine reproductive health systems. However, such outcome-based evidence was predominantly observed in high-resource settings and scarcely explored in studies from developed countries. In the United States, the largest racial or ethnic group was non-Hispanic White, accounting for 58.7% of participants. The sample further included

17.0% non-Hispanic Black, 15.8% Hispanic, and 4.7% non-Hispanic Asian individuals. An additional 6.6% or fewer participants represented other groups, such as non-Hispanic American Indian or Alaska Native, non-Hispanic multiracial, non-Hispanic Native Hawaiian or Pacific Islander, and other non-Hispanic races. These data indicate that women utilizing PCC services are predominantly non-Hispanic white, a pattern influenced by the availability of health facilities in local communities.[20]

A synthesis of the extant literature reveals that, while both contextual frameworks identify education and socioeconomic status as critical determinants, studies originating from developing countries more frequently report structural access issues resulting from the high proportion of the population residing in rural areas and sociocultural impacts. Meanwhile, research from developed countries places greater emphasis on system-level barriers and provider behaviors. These findings underscore the necessity for customized policy interventions that take into account the contextual factors driving inequality in access to utilized preconception care.

Table 1. Characteristic of the included studies

Author (Year, Country)	Method	Main Finding	Sources
Developing Countries			
Taneja et al., 2022 (India)[12]	Qualitative	Socioeconomic and education barriers hinder utilization to preconception services	PubMed
Wegene et al., 2022 (Ethiopia)[13]	Cross-sectional	Limited awareness and distance to facility reduce PCC utilization	PubMed
Amaje et al., 2022 (Ethiopia)[11]	Cross-sectional	Level of education significantly impacts preconception care utilization	PubMed
Fetena et al., 2022 (Ethiopia)[22]	Cross-sectional	Facility distance and provider counseling impact utilization	PubMed
Fikadu et al., 2020 (Ethiopia)[23]	Cross-sectional	Rural residence, low education, and poor knowledge reduce PCC use	Scopus
Girma et al., 2022 (Ethiopia)[24]	Cross-sectional	Formal education and counseling significantly improve PCC knowledge	Scopus
Lemma et al., 2022 (Ethiopia)[25]	Cross-sectional	Planned pregnancy and antenatal education improve PCC intention	Scopus
Li Du et al., 2021 (China)[26]	Cross-sectional	Income inequality and education create service disparities	Scopus
Munthali et al., 2021 (Malawi)[14]	Qualitative	Cultural beliefs and male dominance restrict care access	Scopus
Sajjadian et al., 2024 (Iran)[27]	Cross-sectional	Health literacy and media exposure positively impact PCC uptake	Scopus
Setegn et al., 2021 (Ethiopia)[15]	Cross-sectional	Normative beliefs and perceived control affect intention to use	PubMed
Tesema et al., 2021 (Ethiopia)[28]	Cross-sectional	Education, information, and planned pregnancy increase service utilization	PubMed
Developed Countries			
Maas et al., 2022 (Netherlands)[18]	Qualitative	Healthcare provider role is critical in promoting service access	Scopus
Zace et al., 2021 (Albania)[29]	Qualitative	Fragmented services and lack of provider initiative affect access	Scopus
Hristova et al., 2022 (Bulgaria)[30]	Qualitative	Lack of professional training among providers	PubMed

		impairs PCC implementation	
Casinelli et al., 2023 (USA)[31]	Qualitative	Insurance and cost remain key barriers for vulnerable populations	Scopus
Craig et al., 2025 (UK)[20]	Qualitative	Ethnic disparities and area deprivation affect service engagement	Scopus
Smeets et al., 2024 (Netherlands)[32]	Survey	Younger women and higher education linked to favorable attitudes	ScienceDirect
Daly et al., 2025 (Ireland)[21]	Mixed method	System-level limitations and policy gaps impede service delivery	ScienceDirect
Haiman et al., 2023 (Israel)[33]	Retrospective cohort	Older maternal age associated with higher PCC adherence	Scopus
Jenkinson et al., 2025 (Australia)[17]	Qualitative	Low perceived risk reduces motivation to seek PCC	Scopus
Musgrave et al., 2023 (Australia)[34]	Qualitative	Housing instability and poor provider engagement reduce access	PubMed

Discussion

This systematic review provides a novel comparative perspective on the impact of social determinants on women's utilization of Preconception Care (PCC), drawing parallels between findings from developed and developing countries. The role of social determinants has consistently had a significant impact on the utilization of preconception care (PCC) in women, both in developing and developed countries. Preconception care plays a critical role in public health, as it can lower maternal and child morbidity while improving overall health outcomes for mothers and children in both developing and developed countries.

In developing countries, a variety of factors have the potential to impact women's utilization of the PCC. A study in Ethiopia reports the increase in women's educational and knowledge levels has contributed to a rise in awareness relating to the importance of Preconception Care (PCC). Consequently, women who are unaware of preconception care are less likely to seek preconception services.10 A study in India found that only 1.9% of women living below the poverty line utilized preconception care services. Similarly, Wegene's research reported a participation rate of 1.8% among women with the lowest income levels.[12,13] Socioeconomic status, limited awareness, educational status and distance to health facilities significantly hinder access to PCC services, so the utilization of these services is also limited. This proves the importance of addressing structural inequalities and geographic accessibility in a resource-constrained setting.[12,13] In contrast to the results of research in developed countries, which stated that although the level of education and awareness of women about PCC services is quite high, their utilization is still reported to be limited due to lack of integration of PCC in primary health services, variation in quality between PCC service providers, lack of training of health workers and limited policy support are the main obstacles in the implementation of PCC services.[17,20,29] In qualitative research on Australian women, the distribution of general practitioners and midwives remains unequal across primary health care services.[29]

Higher levels of women's education are strongly associated with greater awareness and utilization of PCC, particularly among those who have received counseling.[35] A study found that 90,9% of women reported learning about PCC through information provided by health services, highlighting the crucial role of health services that can increase women's utilization of PCC.[24] Counseling or exposure to antenatal education increases women's intentions and behaviors in taking advantage of PCC, leading to better reproductive planning and preconception health behaviors.[11,22,23,26] The overall preconception health knowledge of women in Jinka town was 51.1%, with 60.8% of them having heard about preconception care before. Furthermore, the study found that more than 34% of the research participants were aware of preconception healthcare.[23]

There are similarities in findings related to the quality of PCC service providers in developing and developed countries, which emphasizes the importance of improving the quality of services and the provision of health information through the training of health workers. This underscores the importance of health education provided by health care providers. However, the fragmentation of the healthcare system, the variation in quality between PCC providers in different regions, and the lack of training of health workers contribute to the low consistency of PCC utilization, although the level of public awareness is quite high.[17,18,20] Another study in Netherlands found that there are limitations in the integration of PCC in routine clinical practice, limiting the scope of services, although most healthcare workers have a positive attitude towards the concept of PCC services.[32]

Income inequality and disparities in education contribute to significant gaps in the utilization of PCC services, indicating that socioeconomic status is an important factor impacting PCC utilization, particularly in developing countries (Du, et al., 2021). Distance from health facilities, rural residences are geographical roles that are the main contributors to the use of PCC.[12,22,23] Geographic location also impacts service utilization, with only 6.3% of women from rural areas accessing preconception care compared to 93.3% of women from urban areas.11 Male-dominated decision-making and cultural beliefs are reported to have an important role as determinants in the use of PCC, highlighting the importance of gender dynamics as a determinant for women in utilizing PCC.[24]

Studies in developed countries have shown that health literacy and media exposure positively impact the uptake of PCC, demonstrating that information-based interventions can help reduce barriers to access.[27,28] The study found that the frequency of receiving various PCC components, such as: counseling, folic acid supplementation, exercise, blood tests, dental visits, genetic counseling, Pap smears, rubella testing, and diphtheria and hepatitis vaccinations before pregnancy was 66.8%, 53.8%, 45.6%, 71.86%, 44.44%, and 12%, respectively. The results also indicated a relationship between health literacy and the uptake of these components.[27]

Meanwhile, in developed countries, studies from Australia, Ireland and Bulgaria, have reported that the main obstacles to PCC implementation include limited support, inconsistencies in policy implementation, absence of national standards, lack of coordination between agencies, and regional service gaps, all of which hinder the effective delivery and widespread use of PCC.[9,16,17,21] Studies have found in several developed countries that minority, non-white groups tend to have lower access to PCC, resulting in lower utilization.[19,33] The largest racial or ethnic group among participants was non-Hispanic White, while only 6.6% belonged to other non-Hispanic races. These data indicate that women who utilize PCC services are predominantly non-Hispanic White, which is influenced by the availability of health facilities in their local areas.[33] Significant barriers to the implementation of preconception care include inadequate system organization, poor coordination among governmental sectors, ineffective public communication, and the misconception that voluntary care is optional rather than essential. These challenges were addressed through a social marketing framework aimed at fostering government commitment, enhancing intersectoral collaboration, training Maternal And Child Health (MCH) personnel, and raising awareness among women of reproductive age.[36]

The limitation of this study lies in the representativeness of data from developing countries. Most of the included articles originated from the same few countries, which may not fully reflect the broader conditions across all developing regions. Additionally, previous studies have predominantly focused on identifying the determinants influencing women's utilization of *Preconception Care (PCC)* rather than assessing the direct outcomes or impacts of such utilization. Consequently, the specific effects of PCC on women's well-being are not comprehensively illustrated in this review. It is recommended that future researchers examine the specific effects experienced by women concerning the different social determinants that influence their utilization of Preconception Care (PCC).

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Conflict of Interests

None.

Conclusion

Overall, these findings show that in developing countries, the use of PCC in women is influenced by the complex interaction between educational factors, socioeconomic status, geographical accessibility, cultural and gender norms, and health literacy. Structural barriers such as rural domicile cause the distance to health facilities to be limited, resulting in low utilization of PCC. On the other hand, studies from developed countries consistently show that barriers to the use of PCC are more influenced by systemic factors than individual factors. Key determinants include service fragmentation, policy limitations of PCC standards, differences in service quality and racial and ethnic inequalities in some countries. These findings confirm that despite relatively high levels of education and awareness, systemic and structural barriers in the health system remain major barriers to optimal utilization of PCCs.

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