

Empowerment of families and women in preconception: a systematic literature review

Irni Setyawati^{1*}, Suryo Ediyono²

¹Midwifery Bachelor's Degree Program, INKES Yarsi Mataram, Indonesia

²Sebelas Maret University, Indonesia

setyawati.irni80@gmail.com, ediyonosuryo@yahoo.com

ABSTRACT

Article History:

Received : 07-07-2026

Revised : 29-07-2026

Accepted : 30-07-2026

Online : 31-07-2026

Keyword:

preconception health;
health promotion;
pregnancy readiness;
family empowerment;
women of reproductive
age



Preconception health plays a vital role in preparing for a healthy pregnancy. Readiness for pregnancy is influenced by a woman's level of knowledge, health behaviours, family support, access to healthcare services, and psychosocial circumstances; however, scientific evidence regarding the effectiveness of various health promotion interventions during the preconception period remains scattered across diverse contexts and therefore requires comprehensive synthesis. The aim of this study is to review the scientific evidence regarding the empowerment of families or women and health promotion during the preconception period, as well as the associated factors.

This study employed a Systematic Literature Review (SLR) methodology, analysing seven research articles published between 2016 and 2026 using the PICOS approach, sourced from PubMed, ScienceDirect, DOAJ and Google Scholar. Data were analysed narratively to identify the forms of intervention, supporting factors, and various outcomes related to preconception health. Assessment of the quality of studies using the JBI checklist.

The findings of the study indicate that interventions involving families, health education, support from healthcare professionals, couples' counselling, social support, and the use of digital technology can improve reproductive knowledge, family support, nutritional status, health literacy, and readiness for pregnancy. The success of preconception health behaviours is influenced by several key factors, namely family support, the availability of healthcare facilities, self-efficacy, individual motivation, and access to accurate and reliable information; however, a number of studies have also revealed the emotional burden, stress and feelings of guilt experienced by women during the process of preparing for pregnancy.

The conclusion of this study is that comprehensive preconception health promotion involving families has been shown to contribute to improving women's readiness for pregnancy and their health behaviours. The effectiveness of the intervention is influenced by the interaction of various factors at the individual, family, social and healthcare system levels. The development of preconception health programmes needs to integrate family empowerment, psychosocial support, continuous education, and the use of digital technology.

ABSTRAK

Kesehatan prakonsepsi memiliki peran penting dalam mempersiapkan kehamilan yang sehat. Kesiapan kehamilan dipengaruhi oleh tingkat pengetahuan, perilaku kesehatan, dukungan keluarga, akses terhadap layanan kesehatan, serta kondisi psikososial perempuan, namun bukti ilmiah mengenai efektivitas berbagai intervensi promosi kesehatan pada masa prakonsepsi masih tersebar dalam beragam konteks, sehingga perlu disintesis secara komprehensif. Tujuan penelitian

ini yaitu menelaah bukti ilmiah mengenai pemberdayaan keluarga atau perempuan dan promosi kesehatan pada masa prakonsepsi serta faktor-faktornya.

Kajian ini menggunakan metode Systematic Literature Review (SLR) dengan menganalisis tujuh artikel penelitian dari 2016-2026 menggunakan pendekatan PICOS yang berasal dari PubMed, ScienceDirect, DOAJ, and Google Scholar. Data dianalisis secara naratif untuk mengidentifikasi bentuk intervensi, faktor pendukung, serta berbagai luaran yang berkaitan dengan kesehatan prakonsepsi. Penilaian kualitas studi menggunakan JBI checklist.

Hasil kajian menunjukkan bahwa intervensi yang melibatkan keluarga, pendidikan kesehatan, pendampingan oleh tenaga kesehatan, konseling pasangan, dukungan sosial, serta pemanfaatan teknologi digital mampu meningkatkan pengetahuan reproduksi, dukungan keluarga, status gizi, literasi kesehatan, dan kesiapan kehamilan. Keberhasilan perilaku kesehatan prakonsepsi dipengaruhi oleh beberapa faktor utama, yaitu dukungan keluarga, ketersediaan fasilitas layanan kesehatan, *self-efficacy*, motivasi individu, serta akses terhadap informasi yang akurat dan terpercaya, namun sejumlah penelitian juga mengungkap adanya beban emosional, stres, dan perasaan bersalah yang dialami perempuan selama proses persiapan kehamilan.

Simpulan penelitian ini yaitu promosi kesehatan prakonsepsi yang dilakukan secara komprehensif dan melibatkan keluarga terbukti berkontribusi dalam meningkatkan kesiapan kehamilan dan perilaku kesehatan perempuan. Efektivitas intervensi dipengaruhi oleh interaksi berbagai faktor pada tingkat individu, keluarga, sosial, dan sistem pelayanan kesehatan. Pengembangan program kesehatan prakonsepsi perlu mengintegrasikan pemberdayaan keluarga, dukungan psikososial, edukasi yang berkelanjutan, serta pemanfaatan teknologi digital.

Kata kunci: kesehatan prakonsepsi, promosi kesehatan, kesiapan kehamilan, pemberdayaan keluarga, perempuan usia reproduksi.



This is an open access article under the [CC-BY-NC-SA](https://creativecommons.org/licenses/by-nc-sa/4.0/) license

----->-----

A. INTRODUCTION

Preconception health refers to the health status of women and their partners prior to pregnancy, which plays a crucial role in determining the health of the mother, the foetus, and the child in the future. The World Health Organisation (WHO) defines preconception care as a series of biomedical, behavioural, and social interventions provided prior to conception to improve the health of women and their partners and to enhance pregnancy outcomes and child health. This approach is receiving increasing attention as various risk factors—such as poor nutritional status, obesity, alcohol consumption, smoking, lack of physical activity, chronic diseases, and low reproductive health literacy—have been shown to affect fertility and pregnancy outcomes (WHO, 2024). Although the benefits of preconception care are widely recognised, its implementation in various countries still faces many challenges. recent systematic reviews indicate that public awareness of preconception health remains low, access to preconception services is uneven, and the involvement of couples and families in pregnancy preparation remains limited. furthermore, social, cultural, psychological and healthcare system factors also influence the preconception health behaviours of women of reproductive age (WHO, 2022)(WHO, 2024).

Qualitative research by Kirsty Budds et al. in the UK shows that women planning a pregnancy often make lifestyle changes such as improving their diet, reducing alcohol consumption, taking supplements and managing their weight to improve their chances of conception. However, these efforts can also lead to an emotional burden in the form of stress, guilt, anxiety and a sense of responsibility for reproductive success or failure. These findings suggest that preconception health is not only related to biological aspects, but also to psychosocial aspects that need to be taken into account when designing reproductive health programmes (Budds et al., 2025).

On the other hand, various intervention studies have shown that family-based approaches, social support, health education and support from healthcare professionals can improve pregnancy readiness, reproductive knowledge, healthy lifestyle behaviours and health literacy. For example, a study by Yulizawati et al. in Indonesia found that a family support model during the preconception period significantly improved knowledge of ovulation, family support and the nutritional status of women planning a pregnancy. These findings reinforce the importance of family involvement as a supportive factor in preconception care (Yulizawati et al., 2019). In addition to family support, advances in digital health technology are also opening up new opportunities for preconception health promotion. Studies in Australia and Malaysia have shown that support provided through digital apps, online communities and structured behaviour change approaches can increase women's motivation to adopt a healthy lifestyle prior to pregnancy. Interventions that integrate health education, counselling, physical activity, stress management and social support have been shown to have the potential to improve pregnancy readiness and reduce reproductive health risk factors (Walker et al., 2022; Norris et al., 2016).

However, scientific evidence regarding the effectiveness of various forms of preconception health promotion interventions remains scattered across different research designs and national contexts. Furthermore, there are few studies that comprehensively compare the roles of individual, family, community and health system factors in improving women's readiness for pregnancy. In light of this, a comprehensive approach is required to understand the effectiveness of various health promotion interventions during the preconception period. A systematic literature review (SLR) is the appropriate method for identifying, evaluating, and synthesising scientific evidence from various studies that have been conducted. Consequently, the results of the SLR are expected to provide a strong scientific basis for the development of more effective and evidence-based preconception health promotion policies and programmes (Mannarath, 2026).

This systematic review aims to bridge this gap by synthesising evidence from various research designs, including qualitative, cross-sectional, longitudinal, quasi-experimental and randomised controlled trial (RCT) studies, thereby providing a more comprehensive understanding of the factors influencing the success of health promotion during the preconception period. As well as evaluating the effectiveness of interventions, this review also integrates evidence on the role of women's empowerment, family involvement, social support, guidance from healthcare professionals, and the use of digital technology in improving pregnancy readiness and women's health behaviours.

The scientific novelty of this study lies in its presentation of a synthesis that integrates individual, family, social and healthcare system dimensions within a single conceptual framework for preconception health promotion. Unlike previous systematic reviews, which generally focused on a single type of intervention or a single health outcome, this study identifies the interrelationships between various determinants that collectively influence readiness for pregnancy. The results of this synthesis provide a scientific basis for the

development of a more comprehensive model of preconception health promotion that is family-empowerment oriented and adaptable to developments in digital technology and the needs of the community.

This study aims to conduct a systematic literature review (SLR) of various studies on family or women empowerment and health promotion during the preconception period, with the objective of identifying the population, intervention, comparison, outcome, and study (PICOS) characteristics in preconception empowerment and health promotion research and synthesising the most effective intervention approaches as a basis for the development of community-based preconception health promotion programmes.

B. METHODS

This study employed a Systematic Literature Review (SLR) to identify, evaluate and synthesise scientific evidence regarding the empowerment of families or women and health promotion during the preconception period. The systematic review process followed the 2020 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which encompass the stages of identification, screening, eligibility assessment, and inclusion. A systematic literature search was conducted across four electronic databases: PubMed, ScienceDirect, the Directory of Open Access Journals (DOAJ), and Google Scholar. The search targeted articles published between 2016 and 2026, using a combination of keywords based on the research concepts and Boolean operators, namely (“empowerment” AND (“family” OR “women”) AND (“health promotion”) AND (“preconception” OR “preconception care” OR “preconception health”). In addition to the main keywords, the search also utilised synonyms and related terms tailored to the characteristics of each database to enhance the sensitivity of the search.

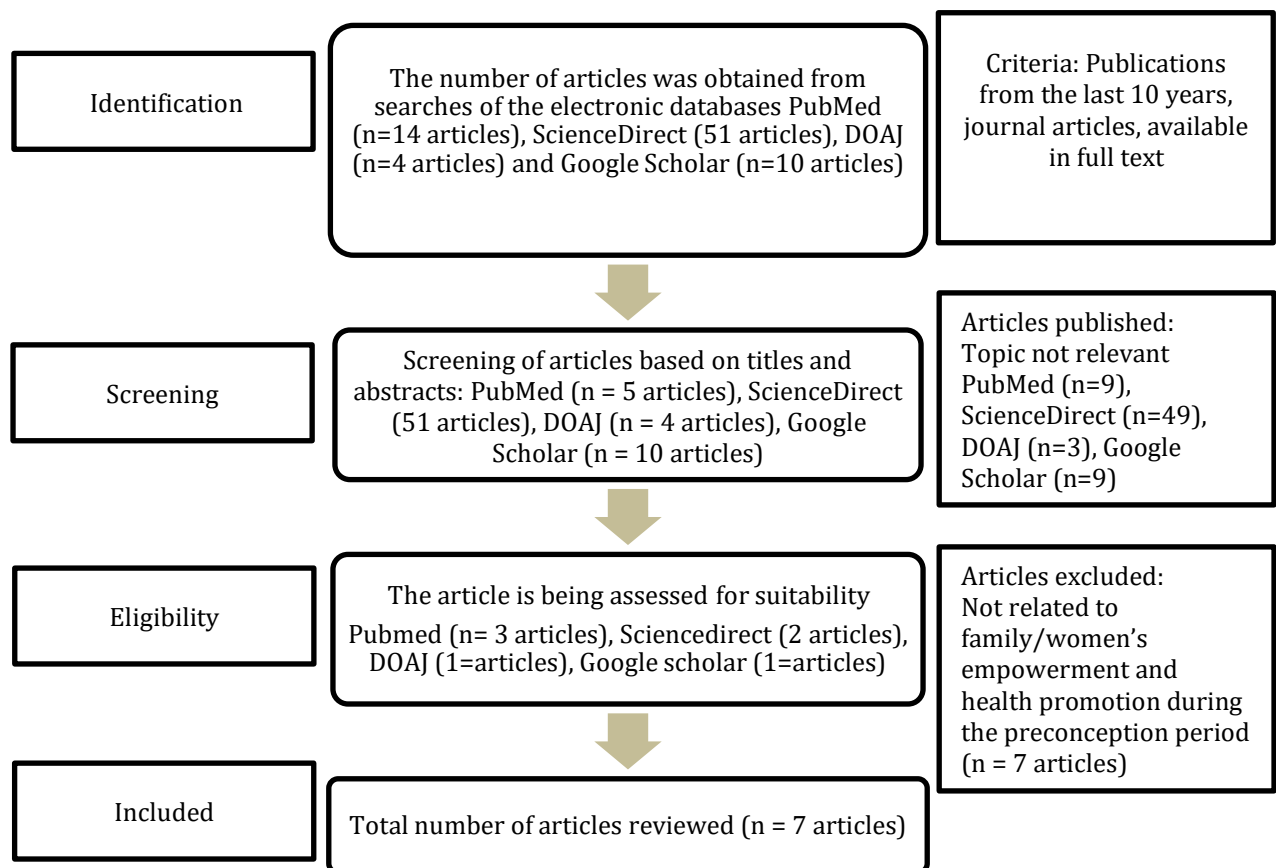
Inclusion criteria were established based on the PICOS approach (Population, Intervention, Comparison, Outcomes, and Study design). The population comprised women of reproductive age, prospective brides, couples, or families involved in pregnancy preparation. Interventions included family or women’s empowerment, health promotion, health education, counselling, and community- or digital-based interventions during the preconception period. The outcomes assessed include knowledge, health behaviours, readiness for pregnancy, health literacy, nutritional status, and other reproductive health indicators. The studies included were original research articles, available in full text, published in international journals during the period 2016–2026, and written in English. Articles in the form of literature reviews, systematic reviews, meta-analyses, editorials, commentaries, conference proceedings, or conference abstracts were excluded from the selection process.

All articles retrieved from the search process were exported to a reference management tool to identify and remove duplicate articles. Screening was then carried out based on titles and abstracts in accordance with the inclusion and exclusion criteria. Articles that met the criteria at this initial stage were subsequently reviewed in full via full-text assessment to determine their final eligibility. The selection process was carried out independently by two reviewers. Where there were differences of opinion regarding an article’s eligibility, these were resolved through discussion until a consensus was reached. The article selection stages are presented in the PRISMA 2020 flowchart.

Data from each article meeting the inclusion criteria were extracted using a pre-designed data extraction form. The information collected included the authors’ names, country of the

study, study design, population, type of intervention, and research outcome. The extracted data were then cross-checked by both reviewers to ensure the consistency, completeness and accuracy of the information prior to synthesis.

Data synthesis was carried out using a narrative synthesis approach, grouping the research findings according to the characteristics of the interventions, forms of empowerment, factors influencing the success of preconception health promotion, and the outcomes reported in each study. Following the selection process in accordance with the PRISMA 2020 guidelines, seven articles were identified that met all the inclusion criteria and were subsequently analysed in this review.



Gambar 1. PRISMA diagram

Table 1. Critical Appraisal

Author	Study Design	Appraisal instrument	Score	Quality
Kirsty Budds, et al	Qualitative	JBIChecklist	8/10	Medium
Yulizawati, et al	A quasi-experimental	JBIChecklist	8/9	High
Ruth Walker, et al	Qualitative	JBIChecklist	8/10	Medium
Agnita Robert Narendra, et al	Qualitative	JBIChecklist	7/10	Medium
Shane A. Norris, et al	Randomised Controlled Trial (RCT)	JBIChecklist	11/13	High

Tony Maria Janke	Qualitative	JB1 Checklist	8/10	Medium
Narjes Sadat Borghei, et al	Cross-sectional	JB1 Checklist	7/8	

C. RESULT AND DISCUSSION

1. Result

The selected articles are summarised and presented in Table 1 below:

Tabel 2. Articles summarised

N o	Author	Loca tion	Study Design	Populati on	Intervention	Outcome
1	Kirsty Budds, et al	UK	Qualitative survey using reflexive thematic analysis	450 women of childbearing age	Changes in preconception health, including changes in diet, alcohol consumption, smoking, weight management, the use of vitamins and supplements, as well as various measures to improve fertility and reduce pregnancy risks	1) Being Fit for Conception (fertility optimisation and risk management); 2) Preconception Health and Emotional Labour (emotional burden, guilt, stress, and responsibility for reproductive outcomes); 3) Interrogating Preconception Health Expectations (criticism of the benefits and risks associated with preconception health recommendations)
2	Yulizawati, et al	Indonesia	A quasi-experimental pretest-posttest design with an intervention group and a control group	120 bridal couples	The Family Mentorship Model during the preconception period, utilising a partnership-based approach and interprofessional education (IPE) to improve pregnancy readiness. The intervention is delivered through counselling, mentoring, interviews and health education	Pregnancy readiness was measured using several indicators: knowledge of the ovulation period, family support, psychological readiness, and nutrition. The results showed a significant increase in knowledge of the ovulation period ($p=0.000$), family support ($p=0.030$), and nutrition ($p=0.000$), whilst psychological readiness showed no significant change ($p=0.120$).
3	Ruth Walker, et al	Victoria, Australia	A longitudinal qualitative study using a participatory/co-design approach	250 pre-conception women	No clinical interventions or programmes were provided. The exposures explored included: experiences relating to health behaviour, social support, access to health information, social connections, shared experiences, digital health support, and factors influencing preconception health	The primary outcomes are the themes that influence women's health behaviours based on the COM-B model, namely: • Capability: health knowledge, health literacy, confidence in making health decisions. • Opportunity: social support, family, friends, healthcare professionals, online communities, health resources. • Motivation:

					and changes in health behaviour	motivation to adopt healthy behaviours, preparation for pregnancy, physical and mental well-being. Additional outcomes: the importance of social connections and shared experiences in supporting health behaviours and preconception health
4	Agnita Robert Narendra, et al	Karnataka, India	Qualitative descriptive study	150 women	The proposed family empowerment strategies and preconception interventions include: nutrition education, couples counselling, the involvement of husbands and families, pre-pregnancy nutritional supplementation, preconception health screening, training for newlyweds, and the integration of preconception services into the RMNCH+A programme	Perceptions of the need for preconception care; barriers to and facilitators of preconception services; recommendations for preconception interventions; family empowerment strategies; improving pregnancy preparedness; improving nutritional status and health prior to conception; and increasing the involvement of husbands and families in women's reproductive health
5	Shane A. Norris, et al	Malaysia	Randomised Controlled Trial (RCT) (with intervention development using the Intervention Mapping approach)	25 women	A complex, health-system-based intervention comprising: support from Community Health Promoters (CHPs) using a motivational interviewing approach; e-health support via a mobile app to promote a healthy lifestyle; a focus on behavioural change: healthy eating, physical activity, reducing sedentary behaviour, and stress management; intervention duration: 8 months with 6 contact sessions	Primary outcome: Change in waist circumference as an indicator of abdominal obesity. Secondary outcomes: Metabolic indicators: HbA1c, lipid profile, blood pressure; Anthropometric measurements: body weight, BMI, hip circumference, waist-to-hip ratio; Health behaviours: dietary patterns, physical activity, sedentary behaviour; Stress levels; Health literacy
6	Tony Maria Janke	Hamburg, Germany	Descriptive-exploration	180 couples	An exploration of women's needs and experiences regarding	1. The need for ongoing support from midwives. 2. The need for reliable and

		man y	tory qualitat ive		midwifery care, support from healthcare professionals, reproductive health information, family involvement, psychological and physical aspects, and navigating the healthcare system during the preconception period and pregnancy	easily accessible information. 3. Emotional and psychological support during preconception and pregnancy. 4. The involvement of partners and families in care. 5. Improved understanding of the healthcare system. 6. The desire for a more empathetic and personal relationship with healthcare professionals.
7	Narjes Sadat Borghei, et al	Iran	An analytic al observa tional study with a cross- section al design	310 women	No interventions were administered as the study was observational in nature. The factors examined were those influencing preconception care (PCC) behaviour, namely: knowledge, self- efficacy (SE), facility structure, and outcome expectations	The primary outcome was preconception care behaviour (PCC behaviour). Secondary outcomes included the mediating relationships and effects of: knowledge, self-efficacy, service facilities, and outcome expectations on PCC behaviour. The results showed that: • Facilities had the greatest influence on PCC behaviour ($\beta = 0.500$). • Self- efficacy influences PCC behaviour ($\beta = 0.215$). • Knowledge enhances self- efficacy ($\beta = 0.182$). • Self- efficacy mediates the relationship between knowledge and service facilities, outcome expectations, and PCC behaviour.

2. Discussion

Based on the seven articles reviewed, preconception health promotion demonstrates a variety of approaches, ranging from health education interventions, family empowerment and digital support to exploring women's experiences and needs.

a. Health Behaviour Change as the Primary Focus of Preconception Health Promotion

A synthesis of various studies indicates that health behaviour change is the primary objective of almost all preconception health promotion interventions. Although all studies reported improvements in one or more health behaviour indicators—such as increased folic acid intake, healthy eating patterns, physical activity, pregnancy readiness and health literacy—the magnitude of the interventions' effects varied (Suto et al., 2025). Methodological differences are also evident in the variety of intervention characteristics employed. Some studies evaluated a single educational session via print media or face-to-face counselling, whilst others combined individual counselling, support from healthcare

professionals, group education, digital applications, and regular follow-ups. These findings reinforce the view that health behaviour change is a complex process requiring reinforcement of motivation, increased self-efficacy, social support, and opportunities to practise healthy behaviours on a sustained basis (Chingara et al., 2026).

This synthesis also demonstrates that social and cultural contexts are among the factors explaining the inconsistency in research findings. Studies conducted in high-income countries tend to make greater use of primary healthcare services and digital technology as means of behaviour change, whilst research in developing countries still relies on direct education provided by healthcare professionals or community health workers. Differences in access to healthcare services, levels of health literacy, cultural norms and family support mean that the effectiveness of interventions cannot be directly generalised across countries (Mantzioris et al., 2026; Chingara et al., 2026). Based on this critical synthesis, future research needs to develop more comprehensive interventions by integrating theories of behavioural change, women's empowerment, partner and family involvement, psychosocial support, and digital technology into a single intervention model.

b. The Importance of Family and Partner Involvement

A synthesis of various studies indicates that the involvement of families and couples is one of the key determinants of the success of preconception health promotion. Recent evidence also suggests that a couple-based approach to preconception care can strengthen communication, enhance shared responsibility for reproductive health, and improve preconception health outcomes, although its implementation remains limited in many countries. Consequently, family involvement is determined not only by the partner's presence, but also by the quality of interaction, the division of roles, and the family's ability to support sustained behavioural change (Doe et al., 2026; Suto et al., 2025).

From a methodological perspective, the strength of the evidence regarding the role of the family also varies. Randomised controlled trials (RCTs) and quasi-experimental studies generally show that family-based interventions improve adherence to healthy behaviours, such as folic acid intake, dietary improvements and the use of preconception services (Suto et al., 2025). Based on this overall synthesis, future research needs to develop models of preconception health promotion that position couples and families as active partners throughout all stages of the intervention, from risk assessment, education and counselling through to follow-up.

c. Social Support and Healthcare Professionals as Key Factors

A synthesis of various studies indicates that social support and the involvement of healthcare professionals are two complementary components in enhancing the success of preconception health promotion. Although there is consensus on the importance of healthcare professionals, empirical evidence still reveals some inconsistencies regarding the effectiveness of their role. Studies conducted in countries with integrated preconception care services report that healthcare professionals are able to improve the identification of risk factors, provide more comprehensive counselling, and enhance the uptake of preconception services. This suggests that improving the quality of care requires not only clinical guidelines, but also capacity building for healthcare professionals and support for the healthcare system (Suto et al., 2025; Caut et al., 2025; Puliani et al., 2024).

Methodological differences also contribute to variations in results across studies. Studies using randomised controlled trial (RCT) and quasi-experimental designs generally show a significant improvement in knowledge, health behaviour, and the use of preconception services following interventions such as counselling or support from healthcare professionals. On the other hand, qualitative research provides a more in-depth picture of women's experiences, including how the quality of communication with healthcare professionals, trust in service providers, and emotional support influence decisions to adopt healthy behaviours (Puliani et al., 2024; Caut et al., 2025). Based on this critical synthesis, future research should develop interventions that integrate social support, family empowerment, and family-centred preconception care. It is also recommended that future research utilise a multicentre randomised controlled trial design, a longer follow-up period, and standardised outcome indicators so that the effectiveness of interventions can be compared more objectively.

d. The Role of Health Knowledge and Literacy

A synthesis of various studies indicates that health knowledge and literacy are key determinants of the success of preconception health promotion, as they influence the ability of women and their partners to understand information, assess risks and make appropriate decisions prior to pregnancy. Although the majority of studies have found a positive association between health literacy and preconception behaviour, some findings still show inconsistencies. These findings indicate that the relationship between health literacy and behaviour is indirect, being mediated by factors such as self-efficacy, family support, motivation, and access to healthcare services (Khan et al., 2024; Sajjadian et al., 2024).

Methodological differences also help to explain the variation in results across studies. Randomised controlled trials (RCTs) and quasi-experimental studies generally show that structured educational interventions can significantly improve knowledge and several indicators of health behaviour. The heterogeneity of study designs, health literacy measurement tools, and outcome indicators makes it difficult to directly compare the magnitude of intervention effects across studies (Khan et al., 2024; Sajjadian et al., 2024). Based on this critical synthesis, future research should develop a preconception health promotion model that integrates the improvement of health literacy with behaviour change strategies, family empowerment and the use of digital technology.

e. Psychological Challenges During the Preconception Period

A synthesis of various studies indicates that psychological challenges are an integral component of preconception health. Although there is a consensus on the importance of psychological health, findings across studies remain inconsistent. These differing findings are likely influenced by variations in respondent characteristics, such as fertility status, history of psychological disorders, family support, and cultural contexts that affect how women perceive pregnancy and the social pressure to have children (Suto et al., 2025; Chingara et al., 2026; Rae et al., 2025).

Methodological differences are also an important factor explaining the heterogeneity of research findings. Randomised controlled trials (RCTs) evaluating psychological interventions, such as mindfulness and cognitive behavioural therapy (CBT), generally

show a reduction in levels of anxiety and depression, as well as an improvement in psychological readiness for pregnancy (Suto et al., 2025; Chingara et al., 2026; Rae et al., 2025). Based on this critical synthesis, future research should develop a preconception care model that integrates mental health screening, evidence-based psychological interventions, family empowerment and ongoing digital support.

f. The Use of Digital Technology in Preconception Health Promotion

Various forms of intervention, such as mobile health apps, web-based platforms, social media, text messages (SMS), and blended care programmes that combine digital media with face-to-face counselling, have generally been shown to improve knowledge, self-efficacy, folic acid intake, healthy eating habits, physical activity, and readiness for pregnancy. However, the effectiveness of each digital platform does not yield uniform results. This difference suggests that the success of digital interventions is determined not only by the use of technology, but primarily by the application of behaviour change techniques that support active user engagement (Nurleli et al., 2025; Torkel et al., 2026; Connor et al., 2024).

This review also shows that the effectiveness of digital technologies is significantly influenced by the social and cultural context, as well as users' level of digital literacy. Research conducted in high-income countries generally utilises mobile applications integrated with healthcare systems, whilst in low- and middle-income countries, interventions more frequently use WhatsApp, SMS or social media as these are more accessible and better suited to the infrastructure conditions. Most research still focuses on women as the primary users, whilst the involvement of partners, families and communities remains relatively limited (Nurleli et al., 2025; Connor et al., 2024; Torkel et al., 2026). Based on this critical synthesis, future research should develop a digital technology-based preconception health promotion model that integrates behaviour change theory, partner and family involvement, support from healthcare professionals, and continuous monitoring via interactive digital features.

D. CONCLUSION AND SUGGESTIONS

Based on a synthesis of the seven articles reviewed, preconception health promotion is a key strategy for improving pregnancy readiness and women's reproductive health. Various forms of intervention, such as health education, family support, couple counselling, support from healthcare professionals, and the use of digital technology, have been shown to improve women's knowledge, healthy lifestyle behaviours, family support, nutritional status, and health literacy prior to pregnancy. The findings indicate that changes in preconception health behaviours are influenced by various factors, including knowledge, motivation, self-efficacy, social support, family involvement, access to healthcare facilities, and professional healthcare support. The involvement of husbands and families has been shown to play a significant role in improving pregnancy readiness and the successful adoption of healthy behaviours during the preconception period.

Overall, effective preconception health promotion is an approach that not only focuses on individual behavioural change, but also involves families, communities and healthcare professionals, as well as adequate support from the healthcare system, in order to ensure

optimal readiness for pregnancy and improve the health of both the mother and her unborn child. Future research should evaluate comprehensive, family-centred preconception health promotion models using robust study designs, such as multicentre randomized controlled trials with longer follow-up periods and standardized outcome measures. Further studies are also needed to examine the effectiveness of integrated interventions that combine women's empowerment, family engagement, psychosocial support, and digital health strategies across diverse cultural and healthcare settings. Such evidence will support the development of more effective and context-specific policies and programmes to improve maternal and child health outcomes.

E. ACKNOWLEDGEMENT

I would like to express my gratitude to the Rector of Inkes Yarsi Mataram, the Head of the Research and Community Service Centre (LPPM) at Inkes Yarsi Mataram, the Head of the PhD Programme in Development Extension and Community Empowerment at UNS, and the lecturers teaching first-semester modules on the PhD Programme in Development Extension and Community Empowerment at UNS.

F. REFERENCES

- Agustina, S. A., Yayi, S., & Hakimi, M. (2024). How to Engage Men in Preconception Health?: A Scoping Review Introduction: *Iranian Journals of Nursing and Midwifery Research*, 29(6), 660–668. <https://doi.org/10.4103/ijnmr.ijnmr>
- Aziz, M. V., Vakilian, K., Khorsandi, M., & Ranjbaran, M. (2023). Preconception Care: Intention to Action- An Intervention Based on the Planned Behavior Theory for Maternal and Neonatal Health: A Randomized Clinical Trial. *Current Women's Health Reviews*, 19(1). <https://www.eurekaselect.com/article/122031>
- Bond, J. C., White, K. O., Abrams, J. A., Wesselink, A. K., & Lauren A Wise. (2023). Sexual dysfunction, distress, and care-seeking among females during the preconception period. *Am J Obstet Gynecol*, 229(1), 1–21. <https://doi.org/10.1016/j.ajog.2023.03.037>. Sexual
- Borghei, N. S., Ebady, T., Bayrami, R., & Nikbakht, R. (2022). Determining the status of preconception care model in pregnant woman of Gorgan city (North of Iran) using structural equation modeling (SEM). *Journal of Education and Health Promotion*, 11(240), 1–8. <https://doi.org/10.4103/jehp.jehp>
- Brammall, B. R., Garad, R. M., Teede, H. J., & Harrison, C. L. (2024). Evaluating Preconception Health and Behaviour Change in Australian Women Planning a Pregnancy: The OptimalMe Program, a Digital Healthy Lifestyle Intervention with Remotely Delivered Coaching. *Nutrients*, 16(1). <https://www.mdpi.com/2072-6643/16/1/155>
- Budds, K., Eldred, L., & Murphy, C. (2025). Promoting empowerment or intensifying reproductive burden? Accounts of preconception health adjustments among women trying to conceive. *Psychology & Health*, 40(11), 1812–1832. <https://doi.org/10.1080/08870446.2024.2359454>
- Caut, C., Schoenaker, D., McIntyre, E., & Steel, A. (2025). Health professionals' beliefs and attitudes towards preconception care: a systematic review. *BMC Health Services Research*, 25(1023). https://pmc.ncbi.nlm.nih.gov/articles/PMC12323077/pdf/12913_2025_Article_13246.pdf
- Chingara, O., Logan, S., & Annabelle, S. (2026). What do we mean by preconception health and preconception care in research and policy? A systematic review. *Human Reproduction Update*, 32(4), 471–487. <https://watermark02.silverchair.com/dmag005.pdf>
- Connor, H. O., Willcox, J. C., Jersey, S. de, Wright, C., & Wilkinson, S. A. (2024). Digital preconception interventions targeting weight, diet and physical activity: A systematic review. *Nutrition and Dietetics*, 81, 244–260. <https://doi.org/10.1111/1747-0080.12842>
- Connor, H. O., Willcox, J. C., Wright, C., & Wilkinson, S. A. (2024). Digital preconception interventions targeting weight, diet and physical activity: A systematic review. *Nutrition & Dietetics*, 81, 244–

260. <https://doi.org/10.1111/1747-0080.12842>

- Daly, M. P., Kipping, R. R., White, J., Sanders, J., & Daly, M. P. (2024). Women ' s views on content and delivery methods for interventions to improve preconception health : a qualitative exploration. *Frontiers in Public Health*, 10, 1–14. <https://doi.org/10.3389/fpubh.2024.1303953>
- Daly, M. P., White, J., Sanders, J., & Kipping, R. R. (2022). Women ' s knowledge , attitudes and views of preconception health and intervention delivery methods : a cross - sectional survey. *BMC Pregnancy and Childbirth*, 22, 1–14. <https://doi.org/10.1186/s12884-022-05058-3>
- Dennis, C.-L., Brown, S. B., Brown, H. K., Bell, R. C., Marini, F., & Birken, C. S. (2022). High-risk health behaviours of pregnancy-planning women and men: Is there a need for preconception care? *Midwifery*, 106. <https://www.sciencedirect.com/science/article/abs/pii/S0266613821003193?>
- Doe, P. F., Nimo, F. A., & Odoom, E. (2026). Couple-based preconception care as a gender- responsive strategy for improving health and well-being : a systematic review IN IN. *BMC Reproductive Health*. <https://link.springer.com/article/10.1186/s12978-026-02385-y>
- Hicks, R., Dune, T., Gu, V., Simmons, D., & Macmillan, F. (2024). A systematic literature review on how consumer and community involvement have shaped and influenced pre-pregnancy care interventions for women with diabetes. *BMC Public Health*, 24(748). <https://link.springer.com/article/10.1186/s12884-024-06951-9>
- Janke, T. M., Makarova, N., Schmittinger, J., Johanna, C., Ebinghaus, M., Blome, C., & Zyriax, C. (2024). Heliyon Women ' s needs and expectations in midwifery care – Results from the qualitative MiCa (midwifery care) study . Part 1: Preconception and pregnancy. *Heliyon*, 10(4), e25862. <https://doi.org/10.1016/j.heliyon.2024.e25862>
- Kandel, P., Lim, S., Dever, M., Lamichhane, P., Skouteris, H., Currie, S., & Hill, B. (2025). Enablers and barriers to preconception dietary behaviours : a mixed method study with women of reproductive age. *BMC Women's Health*, 25. <https://link.springer.com/article/10.1186/s12905-025-04071>
- Khan, M., Dave, A., Benton, M., & Moss, N. (2024). Health literacy interventions for pregnant women with limited language proficiency in the country they live in : a systematic review. *BMC Public Health*, 24(3287). <https://link.springer.com/article/10.1186/s12889-024-20747-8>
- Linda, I., Santoso, H., Lubis, Z., Fidel, M., & Siregar, G. (2022). Empowering Village Health Workers to Influence Preconception Behavior and Increase Utilization of Preconception Health Services in the Deli Serdang Regency. *Macedonian Journal of Medical Sciences*, 10, 191–197. <https://oamjms.eu/index.php/mjms/article/view/8219/8147>
- Maas, V Y F, Poels, M., Ista, E., Menge, L. F., Auweele, K. L. H. E. Vanden, Bie, R. W. A. De, & Smit, D. J. De. (2022). The effect of a locally tailored intervention on the uptake of preconception care in the Netherlands : a stepped - wedge cluster randomized trial (APROPOS - II study). *BMC Public Health*, 22, 1–16. <https://doi.org/10.1186/s12889-022-14343-x>
- Maas, Veronique Y F, Poels, M., Kievit, M. H. De, Hartog, A. P., Franx, A., & Koster, M. P. H. (2022). Planning is not equivalent to preparing , how Dutch women perceive their pregnancy planning in relation to preconceptional lifestyle behaviour change - a cross - sectional study. *BMC Pregnancy and Childbirth*, 22, 1–12. <https://doi.org/10.1186/s12884-022-04843-4>
- Mannarath, A. K. (2026). Systematic literature review for an effective research: a structured framework for social science researches. *Quality and Quantity*, 60. <https://link.springer.com/article/10.1007/s11135-025-02458-3>
- Mantzioris, E., Villani, A., Kellow, N. J., Bhatnagar, D., Osei-safo, E. K., McGowan, M., Jafar, N. K. A., Bogatzke, N., Alesi, S., Astarciglu, T., Mol, B. W., Cowan, S., Wang, R., Moran, L., & Norman, R. J. (2026). *Preconception lifestyle interventions for women — a systematic review and meta-analysis of intervention*. 32(1), 105–127. <https://pmc.ncbi.nlm.nih.gov/articles/PMC12766448/pdf/dmaf021.pdf>
- Mekonnen, B. D., & Tsega, S. S. (2024). Association between preconception care and family planning and previous adverse birth outcomes in Ethiopia : systematic review and meta- - analysis. *BMJ Open*, 14, 1–7. <https://doi.org/10.1136/bmjopen-2023-078299>
- Musgrave, L., Cheney, K., Dorney, E., Homer, C. S. E., & Musgrave, L. (2023). Addressing Preconception Behavior Change Through Mobile Phone Apps : Systematic Review and Meta-analysis Corresponding Author : *Journal of Medical Internet Research*, 25, 1–15. <https://doi.org/10.2196/41900>

- Narendra, A. R., Kowligi, A., Patil, G. H., Swaroop, N., & Kar, A. (2023). The why , what and how of preconception care : an exploratory descriptive qualitative study in Karnataka , India. *Archives of Public Health*, 81(177), 1–12.
- Norris, S. A., Cheah, J., Ho, C., Rashed, A. A., Vinding, V., Skau, J. K. H., Biesma, R., Aagaard-hansen, J., Hanson, M., & Matzen, P. (2016). intervention for couples in Malaysia : application of intervention mapping. *BMC Public Health*, 1–7. <https://doi.org/10.1186/s12889-016-3827-x>
- Nurleli, N., Hadju, V., Indriasari, R., Areni, I. S., & Masni, M. (2025). Pregnancy quality among preconception. *Narra J*, 5(2). <https://pmc.ncbi.nlm.nih.gov/articles/PMC12425530/pdf/NarraJ-5-e993.pdf>
- Puliani, R., Bhatt, Y., & Krishnamurthy, J. (2024). A Scoping Review of Barriers and Facilitators for Preconception Care: Lessons for Global Health Policies and Programs. *Asia Pacific Journal of Public Health*, 36(6–7). <https://journals.sagepub.com/doi/abs/10.1177/10105395241252867>
- Rae, C., Mcrae, R., Holliday, E., & Chojenta, C. (2025). Interventions to Prevent Relapse or Recurrence of Preconception Anxiety and / or Depression in Perinatal Women : A Systematic Review. *Maternal and Child Health Journal*, 29(3), 294–303. <https://doi.org/10.1007/s10995-025-04054-1>
- Sajjadian, F., Amiri-farahani, L., Haghani, S., & Pezaro, S. (2024). Investigating the relationship between health literacy and preconceptual care components during the first 14 weeks of pregnancy : a cross-sectional study. *BMC Primary Care*, 25, 1–9. <https://link.springer.com/article/10.1186/s12875-024-02467-5>
- Smith, N. D., Mitchell, A., Cornell, A., Dahal, M., Gopalakrishnan, L., Johnson, M., Weiser, S., & Puri, M. (2022). The development and feasibility of a group - based household - level intervention to improve preconception nutrition in Nawalparasi district of Nepal. *BMC Public Health*, 22(666), 1–13. <https://doi.org/10.1186/s12889-022-12980-w>
- Stephenson, J., Schoenaker, D. A. J. M., Hinton, W., Poston, L., Barker, M., Alwan, N. A., Godfrey, K., Hanson, M., & De Lusignan, S. (2021). A wake-up call for preconception health: A clinical review. *British Journal of General Practice*, 71(706), 233–236. <https://doi.org/10.3399/bjgp21X715733>
- Suto, M., Inaoka, K., Suzuki, D., Nitamizu, A., Arata, N., & Ota, E. (2025). Behavior changes to promote preconception health : a systematic review. *BMC Women's Health*, 25(23). <https://link.springer.com/article/10.1186/s12905-024-03544-8>
- Torkel, S., Mantzioris, E., Villani, A., Kellow, N. J., Bhatnagar, D., Osei-safo, E. K., McGowan, M., Jafar, N. K. A., Bogatzke, N., Alesi, S., Astarcioğlu, T., Mol, B. W., Cowan, S., Wang, R., Moran, L., & Norman, R. J. (2026). Preconception lifestyle interventions for women — a systematic review and meta-analysis of intervention. *Human Reproduction Update*, 32(1), 105–127. <https://creativecommons.org/licenses/by/4.0>
- Tosh, C., Kavanagh, K., Flynn, A. C., Stephenson, J., White, S. L., Catalao, R., & Wilson, C. A. (2023). The physical- - mental health interface in the preconception period : analysis of 131 182 women planning pregnancy in the UK. *BJOG*, 130, 1028–1037. <https://doi.org/10.1111/1471-0528.17447>
- Walker, R., Quong, S., Olivier, P., Wu, L., Xie, J., & Boyle, J. (2022). Empowerment for behaviour change through social connections : a qualitative exploration of women ' s preferences in preconception health promotion in the state of Victoria , Australia. *BMC Public Health*, 22(1642), 1–14. <https://doi.org/10.1186/s12889-022-14028-5>
- Welshman, H., Dombrowski, S., Grant, A., Swanson, V., & Goudreau, A. (2023). *Preconception knowledge , beliefs and behaviours among people of reproductive age : A systematic review of qualitative studies Sin ' . 175*(September). <https://doi.org/10.1016/j.ypmed.2023.107707>
- WHO. (2022). *Preconception care guidelines and digital health integration*. <https://www.who.int/publications/i/item/9789240040806>
- WHO. (2024). *Reframing care and services to improve preconception health Meeting Report* (Issue May). WHO. <https://iris.who.int/server/api/core/bitstreams/eb2b7bdf-14c4-48a4-a4e9-2adaf2279f69/content>
- Yu, P., Jiang, U., Zhou, L., Li, K., Xu, Y., Meng, F., & Yunping, Z. (2021). Association between pregnancy intention and smoking or alcohol consumption in the preconception and pregnancy periods: A systematic review and meta-analysis. *Clinical of Nursing*, 31(9–10), 1113–1124. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/jocn.16024>
- Yulizawati, Iryani, D., Bustami, L. E., Ayunda, A., & Alief, I. (2019). Influence Of Family Partnership Model

In Preconception Period With Partnership Approach Towards Pregnancy Preparedness. *ICOMHER* 2018, 8. <https://doi.org/10.4108/eai.13-11-2018.2283704>

Zaçe, D., Gatta, E. L. A., Orfino, A., Viteritti, A. M., Luisa, M., Pietro, D. I., Igiene, S., Universitario, D., Cattolica, U., Roma, A. S. L., Policlinico, F., & Gemelli, U. A. (2022). Knowledge , attitudes , and health status of childbearing age young women regarding preconception health - an Italian survey. *J PREV MED HYG*, 63(2), 270–281. <https://pubmed.ncbi.nlm.nih.gov/35968068/>