ORIGINAL ARTICLE

Perceptions of Preconception Care in Rural Karnataka, India: A Qualitative Study

Reedhika Puliani[1]*, Jayanna[2], Bhavana S[3]

OPEN ACCESS

Citation: Reedhika Puliani, Jayanna, Bhavana S. Perceptions of Preconception Care in Rural Karnataka, India: A Qualitative Study. *Ethiop J Health Sci*. 2026;36(4):191. doi:http://dx.doi.org/10.4314/ejhs.v36i4.3
Received: February 17, 2025
Accepted: June 28, 2026
Published: July 1, 2026
Copyright: © 2026 Reedhika P., et al. This open access article is distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.
Funding: Nil
Competing Interests: The authors declare that this manuscript was approved by all authors in its form and that no competing interest exists.
Affiliation and Correspondence:
[1]PhD Scholar, M.Sc., MS Ramaiah University of Applied Sciences, Dept. of Food Technology, Bengaluru, India (rpuliani@gmail.com)
[2]Professor, Public Health, Dept. of Allied Health Sciences, MS Ramaiah University of Applied Sciences, Bengaluru, India; [3]Assistant Professor, MS Ramaiah University of Applied Sciences, Dept. of Food Technology, Bengaluru, India
*Email: rpuliani@gmail.com

ABSTRACT

BACKGROUND: Despite reductions in maternal and child mortality rates, challenges such as anemia, malnutrition, infections, and non-communicable diseases, including diabetes, continue to increase the risk of adverse birth outcomes. Although India has implemented several policies and programs, such as the Reproductive, Maternal, Neonatal, Child and Adolescent Health (RMNCH+A) program, with a focus on adolescent health, preconception care (PCC) remains largely overlooked. Evidence suggests that health interventions implemented before pregnancy are more effective than those initiated during pregnancy in preventing maternal and neonatal complications.

MATERIALS AND METHODS: In-depth interviews using open-ended questionnaires were conducted among healthcare providers (HCPs) (n=5) and women of reproductive age (WRAs) (n=8) at primary health centers and local households in Kaiwara, Chikkaballapur District, rural Karnataka, India.

RESULTS: HCPs demonstrated good knowledge of PCC, including the importance of dietary modifications and nutritional supplementation. In contrast, WRAs had limited awareness of PCC and reported cultural beliefs that encouraged conception immediately after marriage. Most WRAs sought healthcare services only after becoming pregnant, following childbirth, or when experiencing infertility, a pattern that was also confirmed by HCPs. Family influence acted as both a barrier and a facilitator to PCC utilization. Misconceptions regarding diet and the occurrence of unintended pregnancies further hindered PCC uptake.

CONCLUSION: Integrating PCC into existing health programs, implementing community-based educational campaigns, providing culturally sensitive counseling, and strengthening HCP training are essential strategies for improving PCC uptake. Improving access through incentives, family-centered education, and mobile health applications could increase PCC utilization, reduce pregnancy-related complications, and improve maternal and child health outcomes.

KEYWORDS: Preconception care, barriers, facilitators, health personnel, women of reproductive age, community health

INTRODUCTION

Maternal and child mortality rates have declined at both the national (India) and state (Karnataka) levels over the past decade (1,2). However, anemia, malnutrition, infections, and non-communicable diseases such as diabetes continue to pose significant risks for adverse birth outcomes (3).

Despite national policies and programs such as the Reproductive, Maternal, Neonatal, Child and Adolescent Health (RMNCH+A) initiative, which focuses on adolescent health, India places limited emphasis on PCC (2), defined as "any preventive, promotive or curative health care intervention provided to women of childbearing age in the period before and between consecutive pregnancies to improve health-related outcomes for women, newborns and children up to 5 years of age" (4). The National Family Health Survey (NFHS-5) highlights the importance of addressing reproductive health needs to improve maternal health indicators and pregnancy outcomes (5).

Evidence suggests that interventions implemented before pregnancy are more effective than those initiated during pregnancy (4). PCC reduces the risk of birth defects and pregnancy-related complications (6). Pregnancy preparation is influenced by socioeconomic status, educational attainment, cultural beliefs, and access to healthcare services. In Karnataka, cultural norms often encourage early marriage followed by immediate conception, delaying consultation with HCPs. A study conducted in Karnataka reported that rural women had limited awareness of PCC, which restricted its utilization (7).

Furthermore, HCPs and family members play important roles in supporting women to utilize PCC. The involvement of HCPs can enhance women's understanding of the need for PCC, while family support is equally essential because it influences women's decisions to seek healthcare services (8).

Additionally, lifestyle modifications, including improved nutrition and the appropriate use of nutritional supplements, are important components of preconception health. Research indicates that most women are unaware of the lifestyle modifications required before conception, which may adversely affect maternal health and fetal development. Addressing these gaps through targeted education and supportive interventions can improve health outcomes for both mothers and their children (7,9).

This qualitative study explored perceptions of PCC among women and HCPs in Kaiwara, with a particular focus on cultural practices, the roles of HCPs and family members, knowledge of PCC, and willingness to adopt healthy lifestyle changes before pregnancy.

METHODS

Individual, in-depth, semi-structured interviews were conducted among HCPs (n=5) and WRAs (n=8). The study employed a qualitative approach using in-depth interviews (IDIs) to explore participants' perceptions of and challenges related to PCC in Kaiwara, rural Karnataka. Written informed consent was obtained from all participants in the regional language (Kannada) before data collection.

Sampling

A purposive sampling technique was used to recruit the participants. Before data collection, the author introduced herself and explained the purpose of the study. Interviews were conducted with five HCPs at the primary health center (PHC) and eight WRAs in their homes. Participant inclusion was based on their willingness to participate and their availability.

Data collection and ethical clearance: Semi-structured interview guides, originally developed in English and subsequently translated into Kannada, were used to collect data from May to August 2023. Printed questionnaires were administered separately to HCPs and WRAs. Two interview guides, one for HCPs and another for WRAs, were developed based on findings from the quantitative study conducted earlier that year to improve the relevance and clarity of the questions. The development of the interview guides involved discussions with public health experts.

The interview guide consisted of open-ended questions tailored to each participant group and was designed to address: (a) participants' background information, (b) individual barriers, (c) knowledge related to PCC, and (d) the role of HCPs. A single interviewer conducted all the IDIs (20–60 minutes) in Kannada until data saturation

was achieved. All interviews were audio-recorded, and field notes were taken during each interview. Ethical clearance was obtained from the University Ethics Committee for Human Trials, Ramaiah University of Applied Sciences, Bengaluru, India (EC-23/01-PhD-FLAHS).

Data analysis: Data analysis involved transcribing the audio-recorded interviews conducted by the principal investigator. To ensure accuracy, the translated transcripts were reviewed against the original recordings before being imported into QDA Miner Lite (version 3.0.5) software. The data were analyzed using thematic analysis, whereby key phrases were coded and grouped into categories to identify overarching themes and facilitate interpretation of the findings.

RESULTS

B**ackground information on the study participants**: Among the five HCPs, four were women and one was a man, with a mean age of 29.6 years. The participants included doctors, medical interns, and other healthcare professionals. The sample distribution and baseline characteristics of the participants are presented in Table 1.

Table 1: Baseline characteristics of HCP.

Occupation	Gender	Age (years)	Marital status	Number of children (Parity)
Community health doctor 1	Female	31	Married	2
Community health doctor 2	Female	24	Unmarried	0
Community health doctor intern	Female	22	Unmarried	0
Community health doctor intern	Male	23	Unmarried	0
Anganwadi worker	Female	48	Married	2

Of the 8 women who participated in the study with mean age 33.5 years, 3 out of the 8 women did not have children and were unmarried. Following were the baseline characteristics of the women (Table 2).

Table 2: Baseline characteristics of WRAs.

Code	Occupation	Age (years)	Marital status	Number of children
P1	Home maker	25	Married	0
P2	Student	23	Unmarried	0
P3	Home maker	49	Married	3
P4	Home maker	40	Married	2
P5	Home maker	29	Married	1
P6	Home maker	28	Married	1
P7	Student	29	Unmarried	0
P8	Govt. employee	45	Married	2

Perceptions and knowledge of PCC: The analysis of the data identified 4 major themes related to the perceptions and knowledge of PCC: 1) Pregnancy preparation 2) pre-and post- pregnancy nutrition 3) Visit to HCP 4) Role of family/partner.

Pregnancy preparation: Participants expressed varied opinions regarding the ideal age for pregnancy and the appropriate timing for conceiving after marriage. Most HCPs believed that pregnancy during the mid-twenties was most favourable as it reduced maternal and fetal health risks associated with very early or advanced maternal age. As one intern explained,

"Mid-20s would be the right age, around 25–26 years. The age groups should not be very young or very old. Conception before 18 years... increases maternal morbidity. Age groups less than 18 years or more than 35 years affect maternal and fetal outcomes."

On the contrary, a few women preferred earlier pregnancies basis their own life experiences. One participant stated,

"I would say 19 years, the earlier the better. I got pregnant at that age and now I am settled." (P3)

Perceptions also differed regarding the appropriate interval between marriage and conception. HCPs generally recommended delaying pregnancy for several months to two years to allow couples to prepare physically and emotionally for parenthood. As one community health doctor noted,

"When she is ready, maybe a year or two."

Similarly, unmarried women emphasized the importance of developing comfort and understanding with their husbands before planning a pregnancy. Some participants also stressed that pregnancy planning should primarily reflect the woman's decision because of her central role in carrying the pregnancy. One woman explained,

"After a year she can start preparing for pregnancy. The husband's role also is important, but conceiving should be solely the woman's decision as she carries the baby. That's why a woman's decision is more important." (P2)

These views reveal that although HCPs stressed upon medical preparedness, women also considered emotional readiness, marital adjustment, and personal autonomy to be important determinants of pregnancy planning.

Pre- and post-pregnancy diet and lifestyle: Perceptions regarding preconception nutrition (PCN), diet, physical activity, and supplement use varied significantly between HCPs and WRAs. While HCPs demonstrated a complete understanding of PCN, while highlighting the importance of nutrition before conception, most WRAs had low awareness and understood pregnancy preparation through traditional beliefs, cultural practices, and financial constraints.

Most HCPs described PCN as the nutritional care 1-3 months before conception for better maternal nutritional status and reduce pregnancy-related complications. They emphasized assessment of nutritional status, including body mass index and iron stores, before pregnancy. One community health doctor explained,

"Preconception nutrition can include iron levels and BMI. During and before pregnancy what she does matters. If she takes supplements a month before pregnancy and is unable to take some during pregnancy, she will compensate those supplements, and the baby will be safe."

In contrast, most WRAs were unfamiliar with the concept of PCN and associated pregnancy preparation with seeking medical consultation only after conception. As one participant stated,

"Information regarding when to visit the doctor and which doctor to go to for what kind of problem... I think that is what PCC is." (P4)

HCPs consistently emphasized the importance of consuming a balanced, nutrient-rich diet before conception to prevent maternal and fetal complications. Traditional foods such as *ragi mudde*, pulses, and other iron-rich foods were frequently recommended because they were locally available and culturally acceptable. The Anganwadi worker noted,

"Weight management is necessary... they should avoid rice at night and have chapati or ragi mudde... walk more. If the woman is healthy, the child will be healthy. Foods like *kadle beeja*, dals, and hot cooked meals should be taken."

Similarly, a intern highlighted the importance of micronutrient-rich diets, stating,

"Iron, folic acid, iodine and calcium-rich diets are essential, especially cooking in iron vessels and eating iron-rich food like *chikki*."

Although most WRAs believed that they already consumed healthy diets, their perceptions were greatly influenced by affordability. Many women considered avoiding fried foods sufficient for maintaining a healthy diet, while stating that foods such as dry fruits were beyond their financial reach. Interestingly, a few women also recognized that economic disadvantage could compromise dietary quality among poorer households. One participant observed,

"Women below the poverty line eat tamarind rice or lemon rice, lacking nutrients. They should consume protein-rich foods like dal and milk." – P7.

Regarding the post-pregnancy period, both HCPs and WRAs accentuated the importance of continuing a well-balanced diet while limiting the consumption of fried foods. HCPs also stressed that healthy eating should continue beyond childbirth to support maternal recovery and breastfeeding. As one community health doctor explained,

"They should restrict eating outside and deep-fried foods after pregnancy as this affects the child. Until

they stop feeding the child they should continue to eat home food. A balanced diet is a must."

Physical activity was also perceived as an important component of maternal health. HCPs believed that rural women were naturally physically active through farming and household work, while women described remaining physically active by continuing routine domestic activities during pregnancy. One healthcare provider remarked,

"Women here are more active due to fieldwork and household tasks compared to urban areas."

Regarding supplementation, a clear contrast emerged between HCPs and WRAs. All HCPs encouraged preconception supplementation, particularly iron, folic acid, and calcium, highlighting the availability through government programmes and their role in preventing adverse pregnancy outcomes. One intern stated,

"There should be more planned pregnancies than accidental and folic acid can be taken a month before conception as it affects neurological development of the fetus."

Conversely, many WRAs perceived supplements as medications, believing that a nutritious diet alone was sufficient. One woman explained,

"Diet alone is enough. Proper nutrition eliminates supplement need... If you follow a proper diet, you need not even visit the doctor." – P7

Another participant described intentionally avoiding supplements during pregnancy because she did not wish to consume medications.

Although reluctance toward supplementation was common before and during pregnancy, women generally accepted supplements when prescribed by healthcare providers after childbirth. HCPs also emphasized that iron and folic acid supplementation should continue during the postpartum period, particularly among women with anaemia, reflecting the importance of maintaining maternal nutritional status beyond pregnancy.

Role of HCP: Healthcare providers were perceived as key sources of information and guidance for women during the preconception period. HCPs stressed their responsibility in promoting healthy lifestyle practices, correcting misconceptions, and providing counselling on nutrition and supplementation to improve pregnancy outcomes. They also highlighted the importance of identifying and managing pre-existing conditions, such as diabetes and hypertension, before conception. One community health intern explained,

"HCP is required, particularly for diabetes and hypertension. Women should ensure that they consult a dietitian. These things are important if it's a primigravida, as it may lead to long-term diabetes. Educating them on the importance of supplementation before pregnancy is required."

In addition to providing nutritional guidance, HCPs considered addressing food-related myths and misconceptions to be an essential component of preconception counselling. As another intern pointed out

"Clearing misconceptions that women are not allowed to eat non-vegetarian items or eggs is where HCP is required."

Women valued the advice provided by HCPs, specifically regarding adequate rest, balanced diets, physical activity, and healthy lifestyle practices during pregnancy. However, they also stated that counselling sessions were effective if the communication skills of healthcare providers was respectful, empathetic, and supportive. One participant explained,

"I feel HCPs should have a way of talking when giving out information. First, they should talk to women in a way that makes them interested to know more. They should be soft and understanding. Only then will they follow the advice."- P8

Even though the importance of healthcare providers was recognized, both HCPs and WRAs reported that women seldom pursued preconception care unless they experienced fertility-related problems or previous adverse pregnancy outcomes. HCPs indicated that consultations before pregnancy were commonly limited to women with infertility, recurrent miscarriages, or other reproductive complications. One community health doctor stated,

"They do come to us if they are unable to get pregnant or have complications with pregnancy. We send them to Chintamani for investigations that are not available here, and we give them injections to prevent repeated abortions."

Similarly, women reported seeking medical care primarily for menstrual irregularities or infertility rather than for routine preconception counselling. One participant shared,

"Before pregnancy I had irregular periods, so I went to the doctor in Kolar. After going there my periods became normal. Apart from that, we go to the doctor when we have a cold or cough." (P1)

These findings suggest that though healthcare providers recognize the importance of preconception counselling, utilization of preconception services remains largely reactive rather than preventive, with women seeking care only after reproductive or medical problems arise.

Role of family/partner: Family members and partners had a dual role in shaping women's preconception and post-pregnancy health practices. Participants described family support as an important facilitator of healthy behaviours, while also recognizing that family members could reinforce cultural beliefs and practices that limited women's autonomy and informed decision-making.

HCPs stated that pregnancy preparation should be viewed as a shared family responsibility rather than merely the woman's responsibility. They believed that partners and family members could constructively influence maternal health through nutritious diets, reducing physically demanding work, accompanying women to healthcare visits, and providing emotional support. One community health intern stated,

"It's not just the woman's family's responsibility but also the husband's family, who should ensure she avoids heavy lifting and gets proper nutrition."

Women similarly described family and partner support to be fundamental for implementing healthy behaviours before pregnancy. One participant stated,

"Husband and family play an important role. Buying healthy food, showing emotional support, and visiting the HCP with her can make a big difference." - P7

Participants also identified family members as barriers to preconception nutrition and healthy lifestyle practices. HCPs reported that traditional beliefs and cultural practices were often supported by older family members, influencing women's dietary practices during and after pregnancy. One community health doctor described the practice of *Pathiya*,

"…post-pregnancy care, where families impose restrictions like avoiding spicy foods or milk, based on old taboos."

Women shared similar experiences, reporting that food restrictions and advice against physical activity were imposed by family members. One participant explained,

"I was told not to eat certain foods like sesame seeds, radish, and papaya as they could generate heat. My in-laws also told me to avoid exercising." - P5

Some women also reported having limited control over household food choices, as meals were often planned according to the preferences of male family members. One participant stated,

"Most meals are based on what men prefer, so we eat the same." - P4

Participants also accentuated that family support becomes more necessary after childbirth, when women require assistance with infant care and household responsibilities while recovering from delivery. HCPs believed that support from partners and family enabled mothers to maintain their own health and successfully care for their infants. One community health intern explained,

"Family and partner... play an important role because the mother must heal and feed the baby. If they support her by taking care of the child, it would be helpful."

Overall, these findings suggest that family members and partners function as both facilitators and barriers to maternal nutrition and health behaviours. While supportive families encouraged healthy dietary practices and healthcare utilization, prevailing cultural norms and household power dynamics often constrained women's autonomy in making decisions related to their own health.

DISCUSSION

Our study identified several themes influencing PCC uptake in rural Karnataka. While HCPs had knowledge of the right age for pregnancy and dietary needs, WRAs lacked awareness of dietary changes. Though HCPs were aware of optimal PCN, they had limited knowledge of nutrient sources like iron rich foods like lean meat & seafood (10). Training and communication

strategies can improve their knowledge and empathy towards women.

Most WRAs viewed pregnancy as a natural process, preferring conception immediately, resulting in unplanned pregnancies. Women rarely sought PCC, consulting HCPs only after pregnancy, mirroring trends from India, Ethiopia, the Netherlands, Canada and Australia (11-16, 31). Lack of family planning awareness delayed pregnancy recognition. Health campaigns and education programs can help bridge these gaps. Women visited HCPs in infertility or adverse pregnancy outcomes, like trends in South Africa, Ethiopia, India, Australia, the Netherlands, the UK and Kenya (11,19,13,16-18). Contrarily, women in UK sought routing PCC for 'free guidance'. Barriers from studies in the UK, Ethiopia, Malawi, and Australia included unapproachable HCPs and absence of female providers (8,16,20,21). Integrating PCC into primary health services and offering incentives like free check-ups, or food vouchers may improve participation.

HCPs had good knowledge of PCC and believed it helped women to overcome pregnancy-related complications. A South African study had similar results (19). Contrary results were seen in an Indian study indicating limited knowledge among HCPs (11). Lack of knowledge was seen in WRAs, like studies from UK, Denmark and Australia (13,21,22). Lack of knowledge can lead to pregnancy-related complications, citing a need for developing marketing strategies for increasing awareness.

Women citied cost barriers to healthy eating but engaged in physical activity through farming and household chores. Similar dietary beliefs were noted in studies from India, Australia and South Africa where women viewed their diet to be "healthy". Women valued exercise in Australia, while in South Africa, limited access to fitness facilities was a barrier (8,11,23). Contrary results were seen in a Denmark-based study where women wanted to eat healthy during preconception (22). Addressing misconceptions through counseling, promoting availability of affordable nutritious food and establishing kitchen gardens are ways to bridge gaps in PCN.

Furthermore, misconceptions about foods like avoiding non-vegetarian foods, green leafy vegetables, etc. were seen. Similar beliefs were reported in studies from China and India (11,24). Addressing these requires educational materials delivered by Anganwadi workers, with customized counseling sessions for WRAs.

HCPs emphasized the importance of pre-pregnancy supplements, while women deemed them unnecessary. Similar findings in Australia and London revealed women avoided supplements due to cultural practices, or misconceptions like fearing a 'fat child'. In China, herbal medicines like red dates and donkey-hide gelatine were preferred (11,13,14,24,26). Conversely, Australian women willingly consumed preconception supplements (8). Promoting supplement use can involve education including addressing myths and participatory family workshops.

Families influence played a key role with women often requiring approval for PCC, a trend also observed in Ethiopia, Canada, the UK, Australia, Malawi and India including in-laws' dominance, restricted HCP access, and pressure for conception (11-13,16,20,27). Cultural practices like Malawi's 'Kuthimba' requiring approval before antenatal visits, further constrained care access (20).

Despite these barriers, family and partner support facilitated emotional and logistic assistance during pregnancy and postpartum. Studies in Denmark, Australia, the USA, and China highlighted supportive partners facilitating healthy diets (8,22,24,28). Engaging local leaders and training HCPs to address cultural beliefs empathetically can enhance PCC acceptance.

In conclusion, the study explored PCC perceptions among HCPs and WRAs in rural Karnataka, India. HCPs demonstrated good knowledge, but WRAs awareness was limited due to cultural myths, family preferences and societal norms. Women typically sought HCP guidance post-conception or for fertility issues, with family influences serving as barriers and facilitators. Improving PCC uptake requires community-based education campaigns, family engagement, and integrating PCC into existing programs like NHM, JSY, and Poshan Abhiyaan. Training HCPs for

accurate counselling, alongside leveraging mobile health apps, and SMS campaigns, can enhance awareness. Empowering women is crucial to PCC uptake, ultimately reducing pregnancy-related complications and improving outcomes.

Acknowledgements: The authors would like to express their gratitude to the PHC medical staff at Kaiwara for their valuable support during conduction of the study.

REFERENCES

1. Ghosh A, Ghosh R. Maternal health care in India: a reflection of 10 years of National Health Mission on the Indian maternal health scenario. *Sexual & Reproductive Healthcare*. 2020;1;25:100530.
2. National Health Mission. Maternal Health Programme. Ministry of Health and Family Welfare, Government of India. 2013. https://nhm.gov.in/index1.php?lang=1&level=2&sublinkid=819&lid=219.
3. Swain D, Begum J, Parida SP. Effect of preconception care intervention on maternal nutritional status and birth outcome in a low-resource setting: Proposal for a nonrandomized controlled trial. *JMIR* Research Protocols. 2021;16;10(8):28148.
4. Dean S, Rudan I, Althabe F, Webb Girard A, Howson C, Langer A, et al. Setting research priorities for preconception care in low-and middle-income countries: aiming to reduce maternal and child mortality and morbidity. *PLoS medicine*. 2013;3;10(9):1001508.
5. National Family Health Survey (NFHS-5), India. 2020-21. Ministry of Health and Family Welfare.
6. Setegn Alie M, Alemu T, Alemayehu D, Negesse Y, Gebremariam A. Preconception care utilization and associated factors among reproductive age women in Mizan-Aman town, Bench Sheko zone, Southwest Ethiopia, 2020. A content analysis. *Plos one*. 2022;19;17(8):0273297.
7. Narendra AR, Kowlgi A, Patil GH, N S, Kar A. The why, what and how of preconception care: an exploratory descriptive qualitative study in Karnataka, India. *Archives of Public Health*. 2023;29;81(1):177.
8. Khan NN, Boyle JA, Lang AY, Harrison CL. Preconception health attitudes and behaviours of women: a qualitative investigation. *Nutrients*. 2019;29;11(7):1490.
9. Anna James J, Sara George L, Fernandes S. Preconception Care: existing knowledge in Karnataka, India and need for an intervention article information Original Research. *Women Health Open J*. 2019;5(1):12-5.
10. Man Y, Xu T, Adhikari B, Zhou C, Wang Y, Wang B. Iron supplementation and iron-fortified foods: a review. *Critical Reviews in Food Science and Nutrition*. 2022;1;62(16):4504-25.
11. Chutke AP, Doke PP, Gothankar JS, Pore PD, Palkar SH, Patil AV, et al. Perceptions of and challenges faced by primary healthcare workers about preconception services in rural India: A qualitative study using focus group discussion. *Frontiers in Public Health*. 2022; 17;10:888708.
12. Heaman MI, Sword W, Elliott L, Moffatt M, Helewa ME, Morris H, et al. Barriers and facilitators related to use of prenatal care by inner-city women: perceptions of health care providers. *BMC pregnancy and childbirth*. 2015;15:1-3.
13. Lang AY, Bartlett R, Robinson T, Boyle JA. Perspectives on preconception health among migrant women in Australia: a qualitative study. *Women and Birth*. 2020;1;33(4):334-42.
14. Mazza D, Chapman A, Michie S. Barriers to the implementation of preconception care guidelines as perceived by general practitioners: a qualitative study. *BMC health services research.* 2013;13:1-8.
15. Poels M, Koster MP, Franx A, van Stel HF. Healthcare providers' views on the delivery of preconception care in a local community setting in the Netherlands. *BMC health services research.* 2017;17:1-0.
16. Teshome F, Kebede Y, Abamecha F, Birhanu Z. Why do women not prepare for pregnancy? Exploring women's and health care providers' views on barriers to uptake of preconception care in Mana District, Southwest Ethiopia: a qualitative study. *BMC Pregnancy and Childbirth*. 2020;20:1-3.

17. M'hamdi HI, Sijpkens MK, de Beaufort I, Rosman AN, Steegers EA. Perceptions of pregnancy preparation in women with a low to intermediate educational attainment: a qualitative study. *Midwifery*. 2018;1;59:62-7.
18. Ochieng CA, Odhiambo AS. Barriers to formal health care seeking during pregnancy, childbirth and postnatal period: a qualitative study in Siaya County in rural Kenya. *BMC Pregnancy and Childbirth.* 2019;19:1-4.
19. Ukoha WC, Mtshali NG. Perceptions and practice of preconception care by healthcare workers and high-risk women in South Africa: A qualitative study. *InHealthcare* 2021 (Vol. 9, No. 11, p. 1552). MDPI.
20. Chimatiro CS, Hajison P, Chipeta E, Muula AS. Understanding barriers preventing pregnant women from starting antenatal clinic in the first trimester of pregnancy in Ntcheu District-Malawi. *Reproductive health*. 2018;15:1-7.
21. Tuomainen H, Cross-Bardell L, Bhoday M, Qureshi N, Kai J. Opportunities and challenges for enhancing preconception health in primary care: qualitative study with women from ethnically diverse communities. *BMJ open.* 2013;3(7):002977.
22. Pico ML, Grunnet LG, Vinter CA, Aagaard-Hansen J, Kragelund Nielsen K. Barriers and facilitators for sustainable weight loss in the pre-conception period among Danish women with overweight or obesity–a qualitative study. *BMC Public Health*. 2023;23(1):1778.
23. Ware LJ, Prioreschi A, Bosire E, Cohen E, Draper CE, Lye SJ, et al. Environmental, social, and structural constraints for health behavior: perceptions of young urban black women during the preconception period—a healthy life trajectories initiative. *Journal of nutrition education and behavior*. 2019;51(8):946-57.
24. Liu FQ. Discourses of preconception health and care: perspectives of rural women in Zhejiang, China. *Int J Caring Sci*. 2014;7:43-50.
25. Mazza D, Chapman A. Improving the uptake of preconception care and periconceptional folate supplementation: what do women think?. *BMC Public Health*. 2010;10:1-6.
26. Stephenson J, Patel D, Barrett G, Howden B, Copas A, Ojukwu O, et al. How do women prepare for pregnancy? Preconception experiences of women attending antenatal services and views of health professionals. *PloS one*. 2014;9(7):103085.
27. Kretowicz H, Hundley V, Tsofliou F. Exploring the perceived barriers to following a Mediterranean style diet in childbearing age: a qualitative study. *Nutrients*. 2018;10(11):1694.
28. Lewis MA, Mitchell EW, Levis DM, Isenberg K, Kish-Doto J. Couples' notions about preconception health: implications for framing social marketing plans. *American Journal of Health Promotion*. 2013;27(3_suppl):20-7.
29. Wang X, Cheng Z. Cross-sectional studies: strengths, weaknesses, and recommendations. *Chest*. 2020;158(1):65-71.
30. Caruana EJ, Roman M, Hernández-Sánchez J, Solli P. Longitudinal studies. *Journal of thoracic disease*. 2015;7(11):537.
31. Kassa A, Human S, Gemeda H. Level of healthcare providers' preconception care (PCC) practice and factors associated with non-implementation of PCC in Hawassa, Ethiopia. *Ethiop J Health Sci.* 2019;29(1):903.