International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Knowledge Regarding Preconception Care among Women of Reproductive Age in Medical College and Hospital, Kolkata, West Bengal: A Cross-Sectional Study

Jyotsna Mondal[1], Jayanta Das[2], Sushmita Pan[3], Saptaparni Das[4]

[1]PhD Scholar, Desh Bhagat University, Punjab, and Reader, College of Nursing, Medical College Kolkata.
[2]PhD Scholar, University of Calcutta, West Bengal & State RMNCHA Coordinator, West Bengal State Technical Support Unit, State Family Welfare Bureau, Department of Health and Welfare West Bengal.
[3,4]BSc Nursing Student, College of Nursing, Medical College Kolkata

Abstract

Background: Preconception care (PCC) is an important aspect of maternal and child health since it targets preconception biomedical, behavioural and social risks. Even though there has been growing awareness of its contribution to preventing morbidity and mortality for mothers and newborns, awareness and utilization of preconception care services are inconsistent, especially in low and middle income countries. While reproductive and maternal health programmes have come a long way in India, preconception health is not given much attention in the routine healthcare delivery framework.

Objectives: The present study sought to evaluate the knowledge on preconception care among women between reproductive age at Medical College & Hospital, Kolkata, West Bengal and correlate the knowledge score with demographic and obstetric variables.

Methods: A descriptive cross sectional survey design was used in the study. This study was conducted at the Obstetrics and Gynecology Outpatient Department and Ward of Medical College and Hospital, Kolkata where 125 married women of reproductive age were included. The subjects were chosen using non-probability convenience sampling technique. The data was collected by a structured interview schedule comprising socio demographic data, obstetrical profile and knowledge assessment questionnaire on preconception care. Descriptive and inferential statistics were used for data analysis.

Results: The findings showed that most of the respondents (85.6%) had medium knowledge about preconception care, 10.4% had poor knowledge and 4% had good knowledge. On the domain-wise analysis the highest awareness was observed in the domain of menstrual hygiene (89.6 %), lifestyle practices (88.8 %) and counselling (85.2 %). Comparably low knowledge was seen with mental health (58.4%) and vaccination (60%). There were significant associations ($p<0.001$) found when comparing knowledge levels with educational status, gravida, complications during childbirth and previous information received about preconception care.

Conclusion: While there was good overall awareness of preconception care, significant gaps existed in certain areas, specifically immunization, mental health and chronic disease prevention. The results suggest specific educational strategies, awareness creation initiatives in the community, and embedding PCC

counselling within the scope of routine maternal health care. Enhancing preconception health education via nurses, primary health care providers and reproductive health programmes could help improve mother and baby health.

Keywords: Preconception care; reproductive age women; maternal health; knowledge assessment; antenatal care; reproductive health; West Bengal.

Introduction

Preconception care (PCC) is a collection of biomedical, behavioural and social health care interventions given to women and couples before they conceive, regardless of pregnancy intentions, that are aimed at improving maternal, neonatal and child health outcomes (World Health Organization, 2013) [1]. In the past few decades, preconception care has become an essential part of reproductive health as a large number of risk factors for adverse pregnancy outcomes occur prior to the onset of pregnancy. Based on that, the purpose of PCC is to identify and change biomedical, environmental and lifestyle-related risks before-conception, which in turn will help minimise morbidity and mortality among mothers and neonates (Khekade et al., 2023) [2].

MCH remains a major public health issue worldwide particularly in LMICs. While there have been strides in improved institutional delivery, antenatal and immunization services, millions of families around the world are still suffering from preventable maternal and neonatal complications. In 2010, an estimated 287,000 women died from pregnancy and childbirth-related complications worldwide, nearly 3.1 million newborns died in the first month of life, and an estimated 2.7 million stillbirths occurred worldwide (World Health Organization, 2015) [3]. A large number of these complications are linked to risk factors that are either preventable or modifiable, which may be possible to be modified prior to conception. Hence, boosting preconception care has been regarded as a necessary measure to enhance reproductive health outcomes.

Preconception period is a chance to optimize the health of prospective parents before pregnancy. Some studies reveal that poor nutritional status, undiagnosed chronic diseases, infections, Obesity, substance abuse, environmental hazards and lack of knowledge about reproductive health have negative effect on the outcome of pregnancy (Harper et al., 2022) [4]. The early gestation period before many women seek prenatal care, during which time fetal growth and development can be adversely affected by risk factors like smoking, alcohol use, poor nutrition, uncontrolled diabetes, hypertension, and exposure to infections, are areas of concern (Green, 2002) [5].

Nutrition counselling and folic acid supplementation is one of the key elements of preconception care. There is evidence that folate supplementation before conception is effective in decreasing the incidence of neural tube defects in newborns, before pregnancy, folate levels are supplemented with folic acid (Green, 2002) [5]. Likewise, achieving and maintaining a healthy weight, and screening for STIs and mental health can play a significant role in a successful pregnancy.

Reproductive and maternal health services in India have been mostly focussed on antenatal, intranatal and post natal care. The maternal health outcomes have been enhanced through various programmes under the National Health Mission, but there has been limited focus on the health of women before pregnancy. Women often don't seek health care services until they are confirmed to be pregnant, and so there may be less opportunity for preventative care before becoming pregnant. Moreover, maternal anaemia,

malnutrition, adolescent pregnancy, reproductive tract infections, diabetes and hypertension are still high among Indian women and affecting the maternal and neonatal health status.

By mitigating adverse pregnancy outcomes, and encouraging healthier reproductive habits, preconception care can have a positive impact on health care. Recommended interventions during the preconception period are: birth spacing, prevention of teenage pregnancy, contraceptive counselling, optimizing micronutrient status, management of chronic illnesses, prevention and treatment of infections, and reduction of harmful exposures, including tobacco, alcohol, and environment hazards (World Health Organization, 2013) [1]. These interventions can lead to decreases in low birth weight, prematurity, congenital anomalies and infant mortality.

In many developing countries, there is a lack of awareness and utilization of PCC services and increasing awareness of the importance of preconception care (PCC). Few studies conducted in India and other countries have been reported which shows that there is a lack of knowledge about folic acid supplementation, immunization, management of chronic diseases and healthy lifestyle practices among women before pregnancy (Ghosh & Nandi, 2023; Swain et al., 2025) [6, 7]. The preconception care knowledge is commonly associated with educational status, socioeconomic condition, accessibility to healthcare services and exposure to health-related information.

This study has also been corroborated by other studies that reported a moderate to low level of PCC awareness among women of reproductive age (WRA) conducted in Nepal (Thapa & Dangol, 2024), Ethiopia (Guta & Dachew, 2024), and Saudi Arabia (Edris et al., 2024) [8, 9, 10]. Likewise, a positive attitude towards reproductive health was reported, but women showed limited knowledge of specific preconception interventions (Musgrave et al., 2023) [11].

It is therefore important to measure women's knowledge of preconception care to identify gaps in awareness and create intervention in care. The present study was conducted to evaluate the knowledge about pre-conception care among Women of reproductive age in Medical College & Hospital, Kolkata, and West Bengal regarding factors like age, marital status and parity status.

Literature Review

Literature review offers conceptual and empirical basis to understand about the preconception care and the awareness of the government regarding the importance of preconception care. Current evidence shows that, although preconception care is a well-established part of the reproductive health care system, there are inconsistencies in awareness and uptake in different populations and healthcare contexts.

Global Perspective on Preconception Care

Preconception care was identified by the World Health Organization as a key opportunity to lower maternal and child mortality and morbidity and that biomedical, behavioural and social interventions should be combined prior to conception to optimize the reproductive outcome and minimize pregnancy complications and risks (World Health Organization, 2013) [1].

Preconception care was defined by Harper et al. as an effective preventive health intervention that can have a positive impact on population health by intervening with modifiable risk factors prior to pregnancy. They raised the significance of lifestyle modification, nutritional counseling, management of chronic diseases, and reproductive planning (Harper et al., 2022) [4].

In a systematic review undertaken in sub-Saharan Africa, it was observed that women of reproductive age were not well informed and using the preconception care services. The study also indicated that women

with higher educational status and healthcare exposure had higher knowledge about PCC (Woldeyohannes et al., 2023) [12].

Thapa and Dangol did a community based study in Nepal to find that under half of reproductive age women exhibited satisfactory knowledge about preconception care. Higher education level and prior exposure with healthcare workers among the women had relatively better levels of awareness (Thapa & Dangol, 2024) [8].

Guta and Dachew (2024) [9] noted that Ethiopian women were not informed about the critical part of pre-conception care like nutrition supplementation, chronic disease management, and infection prevention.

It has been observed that women had positive attitudes towards reproductive health but their detailed knowledge about preconception care was limited, as observed in a cross sectional study done in Saudi Arabia (Edris et al., 2024) [10].

Musgrave et al., examined knowledge, attitudes and behaviours of Australian women about preconception health and noted that there was a lack of awareness of specific preconception interventions, but that women had largely positive attitudes towards their reproductive health (Musgrave et al., 2023) [11].

Gonzalez Martinez et al. found limited utilisation and awareness of women using health centers about preconception care in Mexico, and the need to incorporate education on PNC into routine maternal health services (Martinez et al., 2024) [13].

Studies conducted in India

A few studies performed in India have shown that there is a moderate to poor awareness level of women about preconception care [6, 7, 14, 15].

Another study carried out in couples from rural-areas of West Bengal found that only an average knowledge level was found among most of the participants about preconception care, including nutrition and family planning, and disease prevention (Ghosh & Nandi, 2023) [6].

Sunila et al. found low levels of awareness of folic acid supplementation, healthy lifestyle modification and pre-pregnancy counseling (Sunila et al., 2019) [14].

James et al. investigated the knowledge of women with relation to preconception care in Karnataka and found limited awareness of women with respect to the reproductive planning, chronic diseases management and nutrition before pregnancy. The authors suggest that there should be more counselling support within a Primary Health Care setting (James et al, 2019) [15].

Swain et al. determined that only small percentage of Indian married women had good level of awareness about the preconception interventions. Educational status and information about healthcare was found to be significantly associated with knowledge levels (Swain et al., 2025) [7].

Doke et al have done focus group discussion with rural women in Maharashtra and found that they had inadequate knowledge of the importance of preconception health. Most of the participants linked reproductive health care mostly with pregnancy and child birth (Doke et al., 2021) [16].

Research Gap

There have been a few studies looking at the awareness of preconception care in other countries, but evidence in eastern India is scarce. Antenatal women have been the focus of many studies, but studies that include reproductive-aged women in their target population are scarce. In West Bengal, scanty data is available related to women's knowledge on Preconception care particularly among the female patients attending Tertiary Healthcare institutions. Knowledge about preconception healthcare among reproductive

age women could be used to determine gaps in knowledge and inform the design of education campaigns and counselling approaches. Hence the present study was planned to evaluate knowledge about preconception care among the reproductive age group women attending at selected Medical College and Hospital in Kolkata, West Bengal and to study the association of knowledge with selected demographic variables.

Objectives of the Study

1. To assess the knowledge regarding preconception care among women of reproductive age.
2. To determine the association between knowledge regarding preconception care and selected demographic variables.
3. To determine the association between knowledge regarding preconception care and selected obstetrical variables.

Significance of the Study

The study adds to the existing body of evidence on women's knowledge about preconception healthcare in India. The results could help healthcare practitioners, policy makers, nursing educators and programme planners to create specific interventions that help to enhance women's reproductive health literacy. In addition, it identifies those areas in which education efforts could be intensified.

Methodology

Research Approach

A quantitative research approach was adopted for the study. The quantitative approach was appropriate since the study was aimed at measuring the knowledge level and finding association between variables in terms of statistical analysis.

Research Design

The cross sectional survey design was adopted. The design allowed the investigator to gather data from participants at one point in time and determine the participants' level of knowledge concerning preconception care.

Study Setting

The study was carried out in antenatal and gynaecology ward and the outpatient department of Medical College and Hospital, Kolkata, West Bengal.

Population

The study was conducted in Medical College, Kolkata, West Bengal with married women of the reproductive age group attending the antenatal and gynaecology department.

Sample, sample size

There were a total of 125 women of reproductive (WR) age involved in the study.

Sampling Technique

A non-probability convenience sampling method was used to select participants. The women who met the inclusion criteria and were available during the data collection were recruited.

Inclusion Criteria

1. Married women of reproductive age group
2. Women willing to participate in the study.

3. Women available during the data collection period.

Exclusion Criteria

1. Women with severe psychiatric illness.
2. Women who were critically ill during data collection.

Data Collection Tools

Two major tools were used for data collection.

Tool I: Socio-Demographic and Obstetrical Profile

This section collected information regarding:

Information collected in this section:

- Age
- Religion
- Education
- Occupation
- Monthly family income
- Type of family
- Residence
- Gravida and parity
- Obstetrical history
- History of complications
- Chronic illnesses
- Previous knowledge about PCC.

Tool II: Knowledge Assessment Questionnaire

The structured questionnaire assessed participants' knowledge regarding:

- Meaning and purpose of PCC
- Folic acid and nutrition
- Lifestyle practices
- Addictive behaviours
- Environmental hazards
- Domestic violence
- Vaccination
- Mental health
- Sexually transmitted infections
- Counselling is involved to address birth spacing issues.
- Genetic conditions
- Chronic diseases
- Menstrual hygiene

Validity and Reliability

Expert review was used as a method to determine content validity, with the assistance of experts specializing in obstetrical nursing and community health nursing. Cronbach's alpha was used to measure the reliability.

Pilot Study

A pilot study was done with 25 women to evaluate feasibility and understanding of the tools. Based on the pilot results, minor changes were made.

Data Collection Procedure

The data collection period was 19 February 2026 to 20 February 2026. Data collection was done with administrative authorization from relevant authorities. Subjects were briefed on the aim of the study and informed consent was given.

Interview schedules were administered by the investigator, one-on-one. Basically, for each interview, it took around 20–30 minutes.

Ethical Considerations

All the ethical requirements were secured from the relevant institutional authorities. There was full adherence to confidentiality and anonymity and participation was voluntary through the study.

Statistical Analysis

Descriptive and inferential statistics were used for the analysis of data. Data were summarized by frequency, percentage, mean and mean percentage. Association between level of knowledge and selected variables were analysed using the chi-square test.

Results

Section I: Distribution of Participants According to Socio-Demographic Characteristics

Table 1: Distribution of Women According to Age

Age Group	Frequency (n=125)	Percentage	Remarks
<30 years	87	69.6%	The majority of participants (69.6%) were below 30 years of age.
≥30 years	38	30.4%	

Table 2: Distribution According to Religion

Religion	Frequency	Percentage	Remarks
Hindu	81	64.8%	The majority of participants belonged to the Hindu religion.
Others	44	35.2%	

Table 3: Distribution According to Educational Status

Educational Status	Frequency	Percentage	Remarks
Secondary and below	76	60.8%	Most women had education up to secondary level.
Higher secondary and above	49	39.2%	

Table 4: Distribution According to Occupation

Occupation	Frequency	Percentage	Remarks

Homemaker	107	85.6%	The majority of women were homemakers.
Working	18	14.4%	

Table 5: Distribution According to Monthly Family Income

Monthly Income	Frequency	Percentage	Remarks
< Rs. 30,000	110	88%	Most participants belonged to lower-income households.
≥ Rs. 30,000	15	12%	

Table 6: Distribution According to Type of Family

Type of Family	Frequency	Percentage	Remarks
Joint family	74	59.2%	The majority belonged to joint families.
Nuclear family	51	40.8%	

Table 7: Distribution According to Habitat

Habitat	Frequency	Percentage	Remarks
Rural	75	60%	Most participants were from rural areas.
Urban	50	40%	

Section II: Distribution According to Obstetrical Characteristics

Table 8: Distribution According to Gravida

Gravida	Frequency	Percentage	Remarks
≤2	99	79.2%	Most women had a gravida less than or equal to two
>2	26	20.8%	

Table 9: Distribution According to Number of Children

Number of Children	Frequency	Percentage	Remarks
≤2	119	95.2%	95.2% had parity less than or equal to two
>2	6	4.8%	

Table 10: Distribution According to Number of Abortions

Number of Abortions	Frequency	Percentage	Remarks
≤2	118	94.4%	94.4% reported fewer than two abortions
>2	7	5.6%	

Table 11: Distribution According to Last Childbirth

Last Childbirth	Frequency	Percentage	Remarks
≤5 years ago	51	40.8%	More than half of the participants had their last childbirth within the previous five years
>5 years ago	74	59.2%	

Table 12: Distribution According to Complications During Childbirth

Complications	Frequency	Percentage	Remarks
No complications	112	89.6%	Most women did not report complications during childbirth
Complications present	13	10.4%	

Table 13: Distribution According to Chronic Illness

Chronic Illness	Frequency	Percentage	Remarks
No	93	74.4%	one-fourth of participants reported chronic illnesses
Yes	32	25.6%	

Table 14: Distribution According to Information Received Regarding Preconception Care

Information Received	Frequency	Percentage	Remarks
Yes	88	70.4%	70.4% indicated that they had previously received information regarding preconception care
No	37	29.6%	

Section III: Assessment of Knowledge Regarding Preconception Care

Table 15: Distribution of Women According to Overall Knowledge Score

Knowledge Level	Frequency	Percentage	Remarks
Poor Knowledge	13	10.4%	The majority of women demonstrated average knowledge regarding preconception care.
Average Knowledge	107	85.6%	
Good Knowledge	5	4%	

Section IV: Domain-wise Knowledge Scores

Table 16: Domain-wise Distribution of Knowledge Scores

Knowledge Domain	Mean Percentage	Remarks
Menstrual Hygiene	89.6%	The highest knowledge score was observed in menstrual hygiene, while the lowest score was observed in immunization and hygiene.
Lifestyle Practices	88.8%	
Counselling	85.2%	
Sexually Transmitted Infections	84.8%	
Addiction	84%	
Nutrition	87.7%	
Chronic Conditions	78.8%	
Environment	70.4%	
Vaccination	60%	
Mental Health	58.4%	
Immunization and Hygiene	41.6%	

Section V: Association Between Knowledge and Demographic Variables

Table 17: Association Between Knowledge and Selected Demographic Variables

Variable	Chi-square Value	p-value	Significance	Remarks
Education	Significant	<0.001	Significant	Educational status and monthly income showed statistically significant association with knowledge regarding preconception care.
Religion	Not Significant	>0.05	Not Significant	
Income	Significant	<0.05	Significant	
Habitat	Not Significant	>0.05	Not Significant	
Type of Family	Not Significant	>0.05	Not Significant	

Section VI: Association Between Knowledge and Obstetrical Variables

Table 18: Association Between Knowledge and Selected Obstetrical Variables

Obstetrical Variable	Chi-square Value	p-value	Significance
Gravida	268.9	<0.001	Significant
Complications During Childbirth	194	<0.001	Significant
Chronic Illness	15.7	0.823	Not Significant
Information Received Regarding PCC	63.2	<0.001	Significant

Discussion

The present study evaluated the knowledge of the women of reproductive age concerning preconception care at a tertiary health care centre of Kolkata. These results offer valuable information into women's awareness of PCC and gaps in knowledge.

Overall Knowledge Levels

Most participants exhibited average level of knowledge about preconception care and a small proportion exhibited good knowledge. These findings compare favourably with other developing country studies, as well as research in India.

Average knowledge level, due to the majority of women knowing some information, but not all, about maternal health and what interventions can be taken during the preconception period. This phenomenon was reported in some past studies.

In the other hand, Ghosh and Nandi (2023) had reported an average knowledge level in West Bengal among married couples in rural areas. Gautam (2025) noted significantly lower awareness among women in Bihar and Thapa and Dangol (2024) noted moderate awareness among women in Nepal.

The results also indicate that, while there is an improvement in maternal health awareness, pre-conception health care is not well incorporated into regular reproductive health education.

Education and Knowledge

Family and educational status proved to be an important predictor of preconception care knowledge. The awareness were good among women having higher level of education.

This result is consistent with the current literature which shows that education improves health literacy, health information seeking and decision-making. Educated women might be more inclined to access information via health facilities, electronic media and social contacts.

Education also affects the decision-making power of women related to their reproduction. Higher educational levels may make women more inclined toward having an active role in adopting preventive health care services.

Knowledge Domains

Interpretation

Preconception care knowledge scores among mothers who had reproductive ages (n=125) were analysed by domain as shown below: The results show that there was discrepancies in knowledge within the different domains of preconception care.

Menstrual hygiene was the domain highlighted with the highest mean percentage score 0.896 (89.6%) followed by the second place of Infection Control with a mean score of 0.845 (84.5%). It is implying that the awareness about menstruation among the participants were not very low.

With regards to knowledge about lifestyle practices a mean score of 3.552 with mean percentage of 88.8% was obtained, thus ranking 2nd. Likewise, the third highest mean percentage score with 85.2% was observed in counselling with very high Mean index.Similarly, counselling had a very high mean index with Mean percentage scores of 85.2% ranking third.

Results showed that participants had good knowledge of sexually transmitted infection (STI) and addiction with mean percent scores of 84.8% and 84% respectively, meaning they were aware of how to prevent them and the harmful effect of substance use before pregnancy.

Moderate knowledge of the areas of environmental factors (78.4%) and domestic violence (76.8%) and non-communicable diseases (76.8%) was observed. Information about genetic diseases was a little less including a 74.4% mean percentage score.

Relatively low knowledge scores were observed for preconception care (64.8%), vaccination (60%), and mental health (58.4%). Mental health was ranked lowest – awareness was low about mental health during the preconception period.

Overall, the findings indicated that although mothers had good knowledge on some of the topics, there were areas of gaps in knowledge concerning vaccination, mental health and basic concepts of pre-conception care. Targeted education interventions and counselling programs on less well-known aspects of preconception care are warranted, as is the importance of meeting these needs of pregnant and postpartum women during this unique period of their lives.

Exercise, fitness, and intuition, rather than formula.Obstetrical experience and knowledge.

The awareness of the women for preconception care was better in those with previous pregnancy experiences. Multiparous women acquire information in earlier pregnancies as a result of interacting with healthcare providers.

This finding provides a good reason to think that opportunities await health education in antenatal care encounters. Relying on previous pregnancy experience, though, could mean that preventive interventions are not implemented in the event of pregnancy.

Role of Healthcare Information

Women who had heard information in the past had significantly higher levels of knowledge about PCC. A finding that highlights the importance of healthcare communication.

Registered health care providers, particularly nurses, midwives and community health workers, have an important role in providing reproductive health education. Information through counselling during out-

patient consultations, immunization clinics, adolescent health programmes and at family planning consultations can enhance awareness.
The role of mass media and the digital platforms in reaching reproductive health information can also be more important in the future.

Conclusions for the Public Health

The results have some implications for situations in maternal and child health programmes.
There is a need to better incorporate preconception care into reproductive health care services in the first place. In the current maternal health programmes, attention is predominantly paid to pregnancy and childbirth and not to time prior to conception.
Second, education measures and interventions ought to target the urban and rural population. The awareness creation level of women with limited educational skills can be susceptible to community-based awareness campaigns.
Thirdly, advice on nutrition, long-term health care, vaccinations, mental health and child spacing should be an integral part of standard health care.
Last, healthcare providers need to be well trained to undertake PCC counselling.

Strengths and Limitations

The study presents important data on the awareness levels of women towards preconception care in eastern part of the country. Additional insights into specific knowledge gaps can also be gained through domain-wise analysis.
It should be noted however that there are some limitations: Convenience sampling was used in a single institution, potentially restricting the generalizability of the findings. Recall and social desirability may also be features of self-reported responses.
Also, the study evaluated the knowledge, not actual practices or use of preconception services.
Despite the above challenges, the findings come to fill an identified gap in the knowledge of women's reproductive health awareness of women of reproductive age.

Conclusion

Preconception care is an underutilized component of maternal and reproductive health and is an important area that needs attention. The present study aimed at assessing the awareness among the women of reproductive age about preconception care among the women attending in a selected Medical College and Hospital at Kolkata, West Bengal.
The results showed that the awareness of each group about the PCC was average, but somewhat limited knowledge was found in a small group of the participants. The core deficiencies identified were related to non-communicable diseases (mental health, vaccination, infection prevention and chronic diseases).
Educational level and obstetrical experience, as well as past exposure to health information were noted to be significantly associated with the knowledge level. The process of health education and counselling in order to elevate knowledge about the reproductive health, was highlighted by these findings.
This study shows that the use of health institutions, community programmes, nursing care and public health education have a positive impact on the mothers and neonates via providing better education on pre-pregnancy care.

Incorporating PCC counselling into regular maternal and reproductive health care services may have the potential of decreasing unnecessary pregnancy problems and help with achieving more comprehensive reproduction and child health goals.

Larger and more diverse populations could be used for future intervention effectiveness studies of the behavioral practices and utilization of health services.

References

1. World Health Organization. Preconception care to reduce maternal and childhood mortality and morbidity. Geneva: WHO; 2013.
2. Khekade H, Potdukhe A, Taksande AB, Wanjari MB, Yelne S. Preconception care: A strategic intervention for the prevention of neonatal and birth disorders. Cureus. 2023;15(6).
3. World Health Organization. Strategies toward ending preventable maternal mortality. Geneva: WHO; 2015.
4. Harper T, Kuohung W, Sayres L, Willis MD, Wise LA. Optimizing preconception care and interventions for improved population health. Fertility and Sterility. 2022.
5. Green NS. Folic acid supplementation and prevention of birth defects. Journal of Nutrition. 2002;132(8):2356S–2360S.
6. Ghosh S, Nandi K. Assessment of knowledge and practice regarding preconceptional care among married couples in rural West Bengal. International Journal of Obstetrics and Gynaecological Nursing. 2023;5(2):20–23.
7. Swain D, Begum J, Parida SP, Senapati S. Preconception care knowledge and factors associated with utilization among married women in India. Journal of Family Medicine and Primary Care. 2025;14(8):3412–3420.
8. Thapa R, Dangol BK. Awareness regarding preconception care among reproductive age women in a community. Journal of Nursing Education of Nepal. 2024;15(1):25–31.
9. Guta NM, Dachew AM. Preconception care: What reproductive-aged women know and think in Ethiopia. BMJ Open. 2024;14(3):e077314.
10. Edris F, Almehmadi M, Alharbi NS, et al. Knowledge, attitudes, and practices regarding preconception care among women in Saudi Arabia: A cross-sectional study. Cureus. 2024.
11. Musgrave L, Homer C, Gordon A. Knowledge, attitudes and behaviours surrounding preconception and pregnancy health: An Australian cross-sectional survey. BMJ Open. 2023;13(1):e065055.
12. Woldeyohannes D, Tekalegn Y, Sahiledengle B, et al. Preconception care in sub-Saharan Africa: A systematic review and meta-analysis. SAGE Open Medicine. 2023.
13. Martinez NH, Paola A, Margarita V, et al. Knowledge and practices of preconception care in women from southeastern Mexico. CUIDARTE Journal. 2024;15(2).
14. Sunila L, Viswanath L, Philip TA. Awareness regarding preconception care among women in reproductive age group. Indian Journal of Public Health Research and Development. 2019;10(9):391.
15. James JA, George LS, Fernandes S. Preconception care: Existing knowledge in Karnataka, India and need for an intervention. Women's Health Open Journal. 2019;5(1):12–15.
16. Doke PP, Gothankar JS, Pore P, et al. Meager perception of preconception care among women desiring pregnancy in rural areas. Frontiers in Public Health. 2021;9.
17. World Health Organization. Ending preventable maternal mortality: A renewed focus for improving newborn health and wellbeing. Geneva: WHO; 2021.