

Perinatal factors affecting knowledge and utilization of preconception care among pregnant women in Addis Ababa: A cross-sectional study

Eriste Nigussa Gamshe^{1*}, Dereje Bayissa Demissie¹

Abstract

Affiliations:

¹St. Paul's Hospital Millennium Medical College

Correspondence :

Eriste Nigussa Gamshe¹

eriste.nigussa@sphmmc.edu.et

St. Paul's Hospital Millennium Medical College

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Background: In Ethiopia, preconception care service is not well established, knowledge regarding preconception care and service utilization is low and few studies were published about determinants of utilization and knowledge level of women.

Objectives: To identify perinatal factors affecting knowledge and utilization of preconception care among pregnant women.

Methods: This cross-sectional study was conducted from January-March 2021, by interviewing randomly selected 331 Ante Natal Care (ANC) attendants at selected hospitals in Addis Ababa. The data was processed and analyzed using SPSS version 21. Bivariate and multivariable logistic regression analyses were undergone to determine perinatal factors affecting women's knowledge and utilization of Preconception Care (PCC).

Results: Two hundred and twenty mothers (68.6%) were found to have a good understanding of preconception care. Perinatal complications [AOR=3.37 (95% CI; 11.05-10.80)], postnatal care utilization [AOR=4.64 (95%CI; 1.14-18.87)], and ever hearing about preconception health and care [AOR=4.48 (95%CI; 2.31-8.72)] were all positive predictors of preconception care knowledge. Only four out of ten women, 40.5%, used preconception care to its full potential. Whereas primiparity [AOR=4.76 (95% CI; 2.27-9.99)], having ever heard about preconception health or preconception care [AOR=11.65 (95% CI; 4.51-30.06)] and having good knowledge increase the likelihood of optimal preconception care utilization [AOR=10.32 (95% CI; 3.46-30.71)].

Conclusion: Women's knowledge of preconception care, as well as their use of the service, was found to be unsatisfactory. Perinatal complications, postnatal care utilization history, ever having information about the care, and primiparity were all found to be positive predictors of a woman's knowledge and utilization of PCC.

Keywords: Knowledge, Preconception care, Perinatal, Utilization

Background

Preconception care is an intervention provided to reproductive-age women, with the overall goal of improving pregnancy outcomes and the health of both the mother and baby(1, 2). It is recommended that preconception care be routinely provided to women before conception, optimally 2-3 months before pregnancy; with a special emphasis given to non-communicable diseases(3, 4). As men also are exposed to sexually transmitted infections, risky behavioral practices, inflicting partner violence and so contribute to many risk factors that influence maternal and child health; preconception care targets not only on women but also suggested to be given for males too (5).

The preconception care(PCC) package comprises of identification, prevention, and management of maternal biomedical, mental, social, and reproductive health problems (2). The key interventions include; screening and management of some intertwined chronic health problems such as cardiovascular diseases, hypertension, diabetes mellitus, anemia, obesity as well as other medical and mental health problems (3, 6).

If left unmanaged, the maternal pre-pregnancy conditions have a great impact on perinatal outcomes, affecting both maternal and fetal health. A woman who is obese before pregnancy is at risk for gestational diabetes, pre-eclampsia, and at risk for having a fetus with neural tube defects, and other congenital anomalies, where the pregnancy may also end up with intrauterine fetal death and cesarean delivery (7-12). Preconception care together with proper antenatal care is recommended as the best strategies to improve newborn outcomes in low-and middle-income countries (13).

Besides its effect of decreasing the risk of adverse pregnancy outcomes, preconception care has a long-term positive impact on maternal health, the health of children, and the health of future generations at the larger scope (3). Evidence also shows that preconception counseling has a significant effect on lowering blood glucose levels, improving dietary habits, promoting folic acid consumption, cessation of smoking and alcohol use, early ANC initiation, having planned pregnancy, and improving perinatal uptake (13-19). Similarly, pre-pregnancy body weight management and

diabetes screening or management are very important in preventing and minimizing the risk of adverse pregnancy outcomes (3). Preconception folic acid (PFA) taken at least 3 months before conception can decrease the incidence of Neural Tube Defects (NTDs) by approximately 46% (20).

Despite its wide range of effects on maternal, fetal and neonatal health; preconception care service is not well established and popularized globally. However, in some high-income countries such as Italy, Australia, Netherland, United Kingdome, the United States, New Zealand, Canada, Israel, Ireland and Japan (14, 21-26) and low-income countries such as Bangladesh, Pakistan, Nepal, India, Philippines, China, and Sri Lanka; preconception care service is already started (13, 27). Yet PCC is less utilized, even in the countries where the service is already started.

Low level of knowledge among care providers and reproductive-age women as well as, unavailability of the service in the health settings are among common factors influencing preconception care utilization (21, 23, 28-30). Similar to other Sub-Saharan, Ethiopia is the region where preconception care is not well established, less known, and less utilized. From very few studies conducted in Ethiopia, the PCC utilization rate ranges between 13.4-15.3% (31, 32). Additionally, only 20% and 27.5% of reproductive-age women are knowledgeable about PCC in Hawasa and Gojam (33, 34). Preconception-related studies in Ethiopia gave less attention to identifying whether perinatal factors have an association with women's knowledge of PCC and their service utilization status. Moreover, almost all the studies were done in regions excluding Addis Ababa, which is the site for federal referral hospitals where many patients are referred from all corners of the country. Thus, this study aimed at the identification of perinatal factors affecting knowledge and utilization of preconception care among pregnant women attending ANC at selected public hospitals in Addis Ababa.

Methods

Study design and period

This cross-sectional study was employed at public hospitals in Addis Ababa from January-March 2021 to identify

Study population

All selected pregnant women receiving ANC at the selected hospital during the data collection period were included in the study.

Sample size and sampling

A single population proportion formula was used to estimate the sample size, with the assumption of 5% precision, 95% confidence, and a 10% non-response rate. Prevalence of 27.5% from a study in Gojam was used to calculate sample size (33). The final sample size calculated was 333. Out of the total six governmental referral hospitals in Addis Ababa, three hospitals were selected randomly. The study participants were chosen by a lottery method. Each pregnant lady was instructed to draw one of two equal-sized rolled pieces of paper with the numbers 0 and 1 printed on it as she left after getting ANC. Finally, individuals who chose the number one piece of paper were included in the study.

Operational definitions

Knowledge on preconception care: The respondent's knowledge was categorized as poor and good based on the mean score of 26 knowledge assessing items, with "Yes" "No" options of response. The respondent's level of knowledge on each category was classified as poor and good based on the mean value of the correct response to each sub-category.

Preconception care utilization: refers to receiving any form of preconception care intervention. The level of utilization is categorized as suboptimal and optimal based on the mean score.

Data collection

Interviewer-administered data collection was undertaken using a structured questionnaire developed by a review of relevant studies. The knowledge assessing items were categorized as knowledge on preconception risk factors, the importance of preconception care and components of preconception care. The exit interview was conducted using the two most spoken languages Amharic and Afan Oromo.

Data quality assurance

Pretest was conducted on 34 pregnant women receiving antenatal

care at other hospitals where actual data collection was not conducted. Accordingly, three questions creating ambiguity were identified and modified in such a way the respondents can understand these easily. After the pretest, validity was checked using Cronbach's Alpha test and found to be valid, with a value of 0.93. Data collection was performed by trained enumerators under the monitor of trained supervisors. The consistency and completeness of each questionnaire were checked daily at the end of data collection.

Data analysis

The verification criteria for preconception care knowledge and utilization assessing questions were dichotomized as "Yes" or "No" responses. A "Yes" response to the verification criteria was considered to show that the woman had awareness of the asked item and the woman utilized the service. Statistical software, SPSS version 21 was used for the data processing and analysis. Association among variables was considered significant with a p-value ≤ 0.05 , both in bivariate and multivariate logistic regression analysis. Adjusted odds ratio (AOR) was used to show and present the strength of association among variables, with a confidence interval (CI) of 95%.

Result

Socio-demographic characteristics and perinatal history of the respondents

The study comprised 331 pregnant mothers, yielding a response rate of 98.2 percent. The highest and lowest ages of respondents are 42 and 20, respectively, with a mean of 27.39 and SD of 4.23. Only 29 women (8.8%) never received a formal education, whereas 1 in 10 (11.2%) had higher education and got a bachelor's degree or higher (Table 1).

One hundred and ten (33.32%) of the respondents have multipara. Postnatal care was provided to the majority of those who had previously given birth. There were 29 (8.76%) women who had experienced a perinatal problem during either the prenatal, intranasal, or postnatal phases. A significant majority of mothers 217(65.5%) had heard about preconception care at some point during their perinatal care (Table 2).

Table 1: Socio-demographic characteristics of pregnant mothers attending antenatal care at public hospitals, Addis Ababa, Ethiopia 2021(n=331).

Socio-demographic variables	Categories	Frequency	Percentage (%)
Age	20-24	84	25.4
	25-29	154	46.5
	30-34	62	18.7
	35-39	31	9.4
Residence	Urban	280	84.6
	Rural	51	15.4
Religion	Orthodox	174	52.6
	Muslim	109	32.9
	Protestant	48	14.5
Marital status	Married	325	98.2
	Single	6	1.8
Woman's Educational status	Never attended formal school	29	8.8
	Primary school(1-8)	105	31.7
	Secondary school(9-10)	101	30.5
	Technical/vocational(10+)	59	17.8
	Higher level(degree or more)	37	11.2
	Woman's Occupation	Government employee	65
Private sector employee		67	20.2
Self-employed		43	13.0
Housewife		156	47.1
Husband/Partner educational status	Never attended formal school	28	8.5
	Primary school (1-8)	81	24.5
	Secondary school 9-10)	126	38.1
	Technical/vocational (10+)	50	15.1
	Higher level (degree or more)	46	13.9
Husband/partner occupation	Government employee	62	18.7
	Self-employee	168	50.8
	Daily laborer	101	30.5

Knowledge of preconception care

Knowledge of preconception risk factors

Only 1 in 3 respondents (33%) have a thorough understanding of all the preconception maternal risk factors that are worth PCC, out of a total of 12 questions posed to test women's knowledge of preconception of maternal risk factors. The majority of respondents are aware that chronic disorders such as hypertension (82.2%), diabetes mellitus (78.5%), heart disease (74.2%), anemia (73.4%), and the presence of STIs (71.6%) during preconception periods are risk factors that affect maternal and fetal health. According to the majority of women's responses to questions about behavioral practices and lifestyle, prescribed drug use (91.2%), cigarette smoking (89.7%), alcohol consumption (85.8%), stress (85.5%), obesity (77.3%), and exposure to environmental hazards (73.4%) are all risk factors if they occur during the period. Overall, 208 (62.8%) [95 percent CI: (57.7-68.8)] of the women have high awareness about risk factors.

Table 2: Perinatal history of the women attending antenatal care at public hospitals, Addis Ababa, Ethiopia, 2021.

Obstetric variables	Categories	Frequency	Percentage (%)
Gravidity (n=331)	Primigravida	115	34.7
	Multigravida	216	65.3
History of previous birth(n=216)	Average=2.1 and maximum 5 pregnancies		
	Ever given birth	209	96.8
Parity (n=209)	Not ever given birth	7	3.2
	Primipara	99	47.4
Place of birth for previous delivery(n=209)	Multipara	110	52.6
	Home delivery	8	3.8
History of PNC utilization(n=209)	Institutional delivery	201	96.2
	Received PNC for the last delivery	197	94.3
History of FP use(n=331)	Not receive PNC	12	5.7
	Ever used at least one form of FP method	208	62.8
History of perinatal complications (n=216)	Not ever used any form of FP method	123	37.2
	Encountered complication in previous perinatal period/s	29	13.4
History of adverse birth outcome (n=209)	Not encounter complication in previous perinatal period/s	187	86.6
	Encountered adverse birth outcome on previous delivery/ries	37	17.7
Types of adverse birth outcome (n=37)	Not encounter adverse birth	172	82.3
	Preterm birth	16	43.2
	Low birth weight	7	18.9
	Congenital anomaly stillbirth	4	10.8
History of medical problem(n=331)	stillbirth	10	27.3
	Have medical problem	80	24.2
Type of medical problem (n=80)	Have no medical problem	251	75.8
	Diabetes mellitus	20	25
	Hypertension	34	42.5
	Anemia	24	30

Knowledge of the importance of PCC

The importance of PCC awareness among respondents was assessed using six items, all of which were properly answered by 137 women (41.4%). Preconception care is beneficial in lowering maternal death 308 (93.1%), newborn death 308 (93.1%), neonatal morbidity 308 (93.1%), and enhancing mother wellness 301(90.93%). Two hundred and fifty-two mothers [(76.1%) [95% CI: (71.3-80.7%)]] had a good understanding of the value of PCC.

Knowledge on components of preconception care

Women's understanding of PCC components was examined using eight items. Only 105 (31.7%) of the women correctly identified all the eight care components in this study. Preconception care includes

promotion of healthy nutrition 260(78.5%) and healthy body weight 260(78.5 percent), counseling on cigarette smoking 248(75%) and alcohol consumption 245(74%), screening and management of mental health 224(67.7%), chronic medical problems 221(66.8%), and counseling on family planning 221(66.8%). In general, 239 (72.2%) [95%CI: (67.4-77%) women had a high level of awareness on PCC components (figure 1).

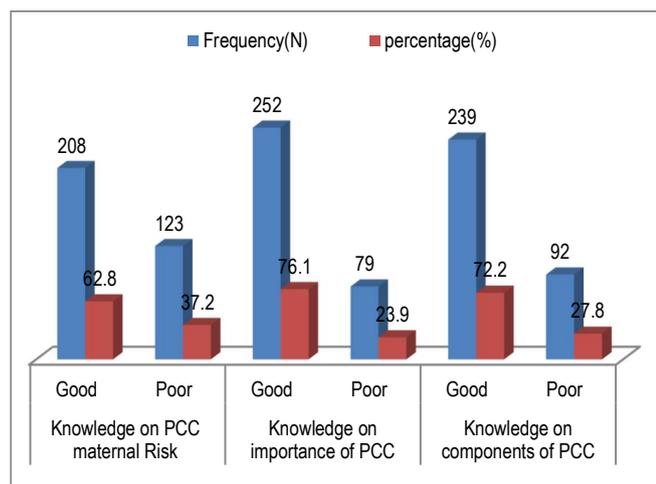


Figure 1: Knowledge on different aspects of preconception health and preconception care among pregnant women attending antenatal care at public hospitals in Addis Ababa Ethiopia, 2021.

Overall knowledge of respondents on preconception care

The mean score for the knowledge assessment question for the respondents' total knowledge on preconception care was 19.72, with a SD of 6.6. As a result, 227 (68.6%) [95%CI: (63.1, 73.7)] have good knowledge on preconception care, while 104 (31.4%) [95%CI: (26.3, 36.9)] had poor knowledge.

Factors associated with preconception care knowledge of pregnant women

Maternal parity, history of postnatal utilization for the previous delivery(ies), prior family planning utilization, history of perinatal complication, and having ever heard about preconception care were found to have an association with the women's knowledge regarding preconception care in the first stage of bivariate logistic regression. When compared to never getting postnatal care in prior deliveries, the multivariate logistic regression analysis indicated that using postnatal care enhances the likelihood of having strong knowledge of preconception care [AOR=4.64 (95%CI; 1.14-18.87)]. Mothers with a

history of prenatal complications were 3.4 times more likely to have good knowledge than those who had not had complications in prior perinatal periods [AOR=3.37 (95%CI; 10.80-11.05)]. The odds of good knowledge among mothers who have ever heard about PCC was 4.48 [AOR=4.48 (95%CI; 2.31-8.72)] (Table 3).

Table 3: Factors associated with preconception care knowledge level among women attending antenatal care at selected public hospitals in Addis Ababa, Ethiopia, 2021

Variables	Category	Knowledge of preconception care		COR (95%CI)	P-Value	AOR (95%CI)
		Poor	Good			
Postnatal care for previous delivery	No	7(11.3%)	4(2.7%)	1		
	Yes	55(88.7%)	142(97.3%)	4.52(1.27-16.05) *	0.03	4.642(1.14-18.9) *
History of perinatal complication	No	61(93.8%)	126(83.4%)			
	Yes	4(6.2%)	25(16.6%)	3.026(1.08-9.08) *	0.04	3.375(1.055-10.8) *
Ever informed about PCC in perinatal periods	No	52(50.0%)	62(27.3%)			
	Yes	52(50.0%)	165(72.7%)	2.661(1.64-4.3) ***	0.00	4.487(2.309-8.7) ***

Note: *** = p -value ≤ 0.001 , ** = p -value 0.01, * = p -value ≤ 0.05

Preconception care utilization status

The women's preconception care utilization was assessed by asking if they had ever used one or more of the study's seven preconception care services. As a result, slightly more than half of them (56.2%) ever received at least one of the preconception care services. Nutritional counseling 132(40%), healthy body weight (40%), family planning 121(36.6%), and healthy lifestyle 111(33.5%) were the most used preconception services. Approximately three out of ten 100(30%) women received folic acid, and 98(29.6%) were screened/managed for chronic medical conditions. Additionally, 80(24%) were evaluated for mental health issues. On a broad scale, this study's mean preconception care utilization was 2.88. As a result, the optimal use of preconception care was 134(40.5%) [95% CI: 35.3-45.6%]; and thus, about six out of ten women, 197(59.5%) [95%CI: (54.4-64.7%)] received suboptimal care.

Factors associated with preconception care utilization

Mothers' parity, whether or not they had ever heard of preconception health or care, and their degree of knowledge about preconception

care were all found to have a substantial link to preconception care use. When comparing primipara women to women who have had two or more births, the likelihood of using PCC to its maximum potential is nearly five times higher [AOR=4.76(95%CI;2.27-9.99)]. The odds of optimal preconception care usage are 11.6 [AOR=11.65 (95%CI; 4.51-30.06)] among women who had never heard about preconception care. Similarly, having adequate knowledge increases the likelihood of appropriate preconception care utilization [AOR=10.32 (95%CI; 3.46-30.71)] (Table 4).

Table 4: Factors associated with the status of preconception care utilization among pregnant women attending antenatal care at selected public hospitals in Addis Ababa, Ethiopia 2021.

Variables	Category	Preconception care utilization		COR (95%CI)	P-Value	AOR (95%CI)
		Sub-optimal	Optimal			
Parity	Multipara	84(66.1%)	26(31.7%)	4.21 (2.33-7.61) ***	0.00	4.76 (2.27-9.95) ***
	Primipara	43(33.9%)	56(68.3%)			
Ever informed about PCC in perinatal	No	94(47.7%)	20(14.9%)	5.202 (2.9-9.02) ***	0.00	11.64 (4.51-30.06) ***
	Yes	103(52.3%)	114(85.1%)			
Knowledge level about PCC	poor	90(45.7%)	14(10.4%)	7.210(3.8-13.4) ***	0.00	10.3(3.46-7-30.705) ***
	good	10(54.3%)	120(89.6%)			

Note: *** = p -value ≤ 0.001 , ** = p -value 0.01

Discussion

Pregnant women's understanding of preconception care is less than excellent, according to this survey, with 68.6% having a good awareness of preconception care. This result is higher compared to studies from Hawasa (20%) (34) and Gojam 27.5% (33). This could be because women in hospitals in Addis Ababa may have better access to health-related information. Similarly, the participant's level of understanding of preconception care was better than previous studies from Nepal and Kelantan (35, 36). However, this could also be related to the small sample size in those previous studies. Having a history of using postnatal care, receiving information about PCC, and having a history of perinatal difficulties are all-powerful enablers for pregnant women to have a high level of preconception care knowledge. In this study, women who had previously used postnatal care were 4.6 times more likely to have good knowledge of preconception care, similar to a study conducted in the West Shoa

Zone (37). This could mean that women were counseled about preconception health care as part of their reproductive life plan while attending postnatal care services. This is confirmed by a study conducted in Sweden(38), which found that providing reproductive life plan counseling as part of normal maternity and reproductive health care dramatically boosted women's understanding of preconception care. Similarly, having had a perinatal problem in a previous pregnancy increased the likelihood of having strong knowledge by around 3.4 times. A woman who has had a perinatal problem in the past is likely to be concerned about future pregnancies and seek health information. As a result, these women may seek medical counsel or read other sources to gain a better grasp of preconception care when planning a pregnancy.

In this study, it was discovered that only 40.5% of respondents used preconception care to its full potential. It is, however, substantially higher than the findings of studies from Debreberhan and Mekelle, which were (13.4%) and (18.2%) respectively (31, 39). This could be due to socio-demographic differences between the populations in the different regions. In addition, unlike earlier research, the current one was conducted in a health facility. Women who have a habit of using institutional-based maternal health services have the opportunity to use other maternal or reproductive health services, such as preconception care. However, it is lower than findings from studies conducted in Australia and Adama, which found that preconception care was used by 54% and 48.4% of women, respectively (25, 40). Previous research has concentrated on a specific population of women (women with diabetes mellitus) and a specific preconception care program (folic acid provision). This may show that a preconception care program that focuses on women with certain health issues and provides specific types of treatment can improve the service's practicability and utilization. Primipara mothers, mothers who had ever heard of preconception care, and mothers with good knowledge were shown to be the best users of preconception care in this study. Previous studies in Bangladesh and Pakistan, as well as Mekelle (4,41) back up the current study's findings, demonstrating that there is a direct link between preconception care knowledge and care service utilization. This is sensible because knowledge is crucial in bringing about the necessary behavioral change, which includes the

use of health-care services.

Because this study used a strictly quantitative methodology, it was limited in its ability to investigate additional personal, social, environmental, and institutional aspects that may have influenced a mother's comprehension and use of preconception care. As a result, it is critical to make recommendations for future qualitative research.

In conclusion, this study discovered that just slightly more than half of the study participants have adequate information and low preconception care uptake is demonstrated. Knowledge of preconception care was found to be positively predicted by a history of postnatal care utilization and perinatal complications, as well as having ever heard about preconception health and health care. Primiparity, receiving preconception care information and having a solid understanding of preconception care were all characteristics that influenced a mother's preconception care uptake. To work on scaling up the continuum of maternal health care one step before pregnancy, it is critical to promote preconception care and build PCC delivery systems. When developing effective implementation strategies for boosting PCC delivery and uptake, it will be critical to integrate preconception care services with other maternal health treatments.

Abbreviations

ANC: Antenatal Care

AOR: Adjusted Odds Ratio

CI: Confidence Interval

FP: Family Planning

NTD: Neural Tube Defect

PCC: Preconception Care

PFA: Preconception Folic Acid

PNC: Postnatal Care

Ref: Referent

RH: Reproductive Health

SD: Standard Deviation

WHO: World Health Organization

Declaration

Ethics approval and consent to participate

The ethical review board at St. Pauls' Hospital Millennium Medical

College, and Ethical Review Committee at Addis Ababa Health Office had approved the research. These two bodies wrote a formal letter to the hospitals where research was conducted. The study was conducted under the provisions of the Declaration of Helsinki. Informed verbal consent was obtained from all individual participants included in the study.

Consent for publication

Not applicable.

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Authors' contributions

Gamshe EN contributed to the conception of the idea, designing the work, analyzing and interpreting the data, as well as drafting the manuscript. Demissie DB Contributed analyzing and interpreting the data and substantively revising the work

The authors have approved the submission of this final version. They have both be personally accountable for their contribution and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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Competing interest

Both authors have no conflict of interest related to this work.

Availability of Data and Materials

All the relevant data are generated in line with the objectives and included in this article. Where supplemental information is needed, the datasets used during the current study are available from the corresponding author on reasonable request.

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