AGE AT NATURAL MENOPAUSE AND ITS ASSOCIATED FACTORS AMONG WOMEN IN ADDIS ABABA, ETHIOPIA

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ABSTRACT

BACKGROUND: Menopause is the permanent cessation of menstruation. Women tend to live one third of their life during the postmenopausal period. The timing of natural menopause varies genetically, ethnically, and geographically.

OBJECTIVES: The aim of the study was to determine the timing of menopause and prevalence of associated symptoms and explore the existing gap in health needs of postmenopausal women.

METHODS: A cross-sectional study was conducted from February to March 2024 at College of Health Sciences among 408 eligible women. A pretested standardized questionnaire was used to collect data from eligible postmenopausal women of ages 30-60 years. Data was analyzed using SPSS version 25.

RESULT: The mean age of the study participants was 51.78 ± 5.43 years. The mean age of menopause was 45.05 (±4.65) years. Premature menopause was reported in 10.0% of the women. Only 1.5% had late menopause (≥55 yrs) while 47.3% (193) had menopause at ages 45-49 years and 12.5% at age of 50-54 years. Hot flushes was the commonest peri-menoausal symptom experienced by 202 (49.5 %) of the participants. Night sweating 199 (48.8%), mood change 147 (36.0%), history of peri-menoausal weight gain 158 (38.7%) and sleep disturbance 128 (31.4%) were among the other symptoms reported by participants. Multiparity (AOR= 3.4, 95%CI=1.138-9.796) and previous implant contraception use (AOR= 2.05, 95%CI=1.033-4.058) were significantly associated with age at menopause of 45 yrs.

CONCLUSION: The mean age of natural menopause in our study (45.05 years) was lower compared to many reports from developing countries and other local studies. However the prevalence of pre mature menopause (10.0%) was higher than most prior reports. Hot flush was the commonest menopausal symptom. Parity and use of Implants were significantly associated with age at menopause of ≥ 45yrs.

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INTRODUCTION

Menopause is the permanent cessation of menstruation.It is an important milestone in women signaling the end of a woman's reproductive life. Women live about one third of their life during thepostmenopausal period.The population of women in the post menopausal age is growing globally as a result of population-wide increases in life expectancy.[1, 2]

The timing of natural menopause varies in different populations affected by genetics, ethnicity, and geographic location. The median age at natural menopause is currently approximately 51 years.[1, 3] The reported ages of natural menopause in Europe, North America, Latin America and Asia were 50.1-52.8 years, 50.5- 51.[4], 43.8-53, and 42.1-49.[5] respectively.[4] Studies from Ethiopia reported that the age of menopause ranged from 46 to 49 years.[5, 6]

Menopause has impact on different body functional systems including the genitourinary, musculoskeletal and endocrine systems.[3, 7, 8] Early menopause has been associated with increased risks of cardiovascular disease and osteoporosis, while late menopause has been associated with increased risks of breast, endometrial and ovarian cancers.[9-11]

Age at menopause is an important marker of population health as increasing age of menopause by one year is associated with reduction of mortality by 2% .[12]

Menopause associated symptoms are common and has a negative impact on the wellbeing of individuals. The prevalence of menopausal symptoms is high, reported by 40 to 87% of postmenopausal women.[7, 13] Early symptoms of menopause include commonly autonomic symptoms and menstrual disorders whereas late symptoms are related to genitourinary, musculoskeletal and cardio vascular symptoms.[8, 14, 15] The symptoms and their severity differ from women to women as a result of different factors including BMI, lifestyle, economic status and level of education.[7]

Menopausal symptoms, particularly the vasomotor and sexual dysfunction, affect quality of life.[7] Menopause is also highly associated with poor reproductive health quality of life, emotional instability, decreased cognitive ability (fogging) and repetitive vasomotor symptoms in addition musculoskeletal and sexual dysfunction. These outcomes may, in turn, result in poor work performance and social activity, particularly in those who withearly menopause.

Many factors affecting the age of menopause have been reported. These factors include genetic, obesity, substance use, social levels, cigarette smoking, BMI, ethnicity, education, nutrition and supplements, menarche age, oral contraceptive use, parity, region, and country.[4, 8, 12, 15-18] Age of menopause is lower in developing countries compared to industrialized nations which has a great impact on early morbidity and mortality of women due to a progressive decline in estrogen secretion.[19]

In our society; losing a mother is traumatic as she is the corner stone of the family. The few studies conducted in Ethiopia reported that the age of menopause was very low compared to other African studies.[5] Hence, identifying factors associated with menopausal ageisimportant to decrease menopause related health risks.

In order to plan for early diagnosis and management of various complications, understanding the age at menopause and changes associated with menopause is crucial.There are very limited published studies in Ethiopia on menopause. Hence, the aim of this study was to determine the age of menopause and associated factors among Ethiopian women at three hospitals.

METHOD AND MATERIALS

Study Design and Setting: This is a cross-sectional descriptive study conducted from February to March 2024. Data was collected from patient attendants and patient visitors from Gandhi Memorial Hospital (GMH), Zewditu Memorial Hospital (ZMH), Tikur Anbesa Specialized Hospital (TASH) and ALERT Specialized Hospital with equal proportion. These hospitals are referral hospitals treating patients mostly from all corners of Addis Ababa and the surrounding areas.

Study population: All eligible patients' attendants and visitors in the four hospitals between ages 30 to 60 years who were in the post menopausal period during the study period were included. Women who had primary amenorrhea, taking hormonal contraceptives, currently pregnant or lactating, and had hysterectomy or bilateral oophorectomy were excluded. Those participants identified to have health issues related to perimenopause were linked to Gynecologic OPDs for further evaluation and management.

Sample size determination: The sample size was determined using a single population proportion formula and by considering the prevalence of menopausal hot flush 65.9 % in a previous study.13 Adding 15% non-response rate the total sample size calculated was 397 participants. A total of 408 participants who had complete interview records were included in the study.

Data collection and study tools: Data was collected using a standardized pretested questionnaire which was adapted from prior similar study reports and organized based on the study objectives.[3, 4, 8, 13, 14, 20, 21] Data collected included socio-demographic variables (age, marital status, residence, educational level, religion, ethnicity, occupation, economic status, estimated average monthly family income, life style and habits (smoking, alcohol, coffee, diet)), reproductive variables (age of menarche, age at first delivery, parity, contraceptive use, sexual dysfunction, unilateral oophorectomy, menstrual cycle regularity, Hx of infertility), Medical illnesses (DM, HPT, CVD, osteoporosis), and premenopausal symptoms (vasomotor disturbance, mood disorders, sleeps disorders).

The dependent variable was the age at cessation of menses for more than one year. The questionnaire was pre tested on 5% of the sample size ofparticipants from each facility.

Data collection procedure: Data was collected by trained BSc nurses recruited for data collection. Potential study participants (attendants and visitors) at out-patient and in-patient wards were contacted and informed about the study using the information sheet. After obtaining informed consent from eligible participants data was collected through face-to-face interview in a private area maintaining confidentiality. The study participants were recruited and included using quota sampling by serially registering and selecting the women who fulfill the inclusion criteria until the allocated sample size was fulfilled. To ensure data quality and completeness the data collection procedure was supervised by the investigators.

Data analysis: Data was entered in to Epi Info version 7.1.3 and analyzed using the Statistical Package for Social Studies (SPSS) version 25. Socio demographic, reproductive and medical variables were independent variables included in analysis. Age at menopause was the dependent variable dichotomized in to age at menopause with outcome variable of age below 45 and ≥45 years. Descriptive statistics was used to summarize and describe data. A stepwise analysis was done to see potential association and strength of association between the independent and the selected outcome variable (menopause at age ≥ 45 yrs). Variables associated with age at menopause with p-value of <0.2 in bivariate analysis were included in a multivariate model. For each of the study variables, the association was estimated by the odds ratio (OR) with the 95% confidence interval (95% CI). A P value of less than 0.05 was considered statistically significant. Figure 1 below shows that the data has come from a population where the mean age is nearly normally distributed. Hence, we have confirmed that we can apply parametric statistics. (Figure 1)

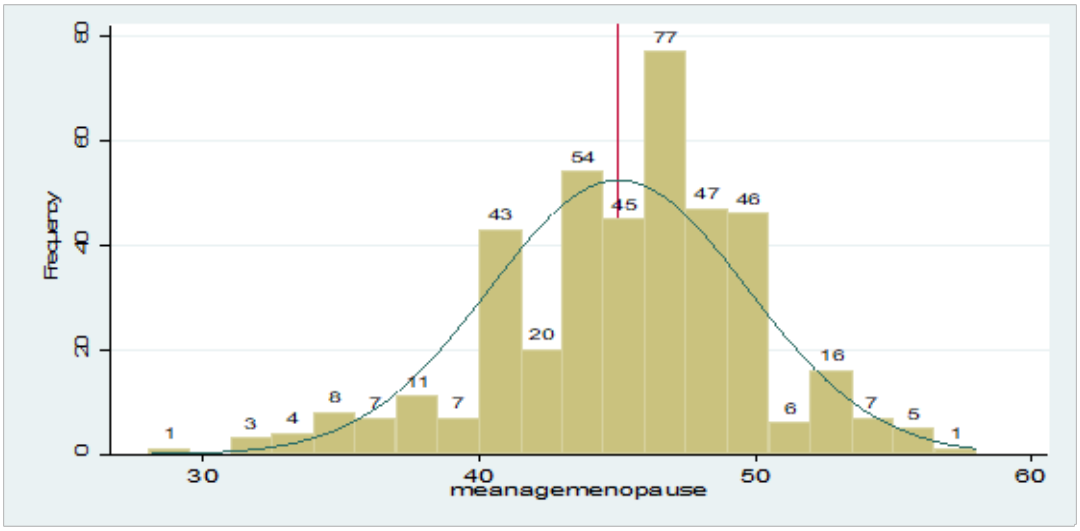

Figure 1: The age distribution of study participant post menopausal women in Addis Ababa, Ethiopia, February to March 2024. (n -408)

Operational Definitions:

Natural menopause: is recognized after 12 consecutive months of amenorrhea for which no other obvious pathological or physiological cause is present.

Patient attendant and visitors: Any woman visiting or attending or caring for (an in-patient) who is not visiting the hospital for her medical care at OPD or in any of the wards of the hospital.

RESULTS

Socio-demographic and behavioral Characteristics:

A total of 408 eligible participants were enrolled in the study. Their mean age was 51.78 ± 5.43 years while the age range was 37 to 60 years. Majority were 50years and above and urban dwellers with proportions of 51.7 % and 99.8 % respectively. Sixty percent were married. More than 77% had formal education. Only 189 (46.4%) were engaged in different outdoor work activity while others were limited to in house activities. Majority, 84.6%, were Christians. Majority, 57.4 %, had income less than 50 USD per month. Coffee drinking habit frequency was daily in 77.9% while 12.0%and 10% drink coffee occasionally and never drank respectively. Majority (51.2%) never drank alcohol while 47.8% drank occasionally and only 4(1%) drank regularly. No woman was found to have smoking history.

Age at menopause

The reported age at menopause ranged from 28 to 58 years. The mean age of menopause was 45.05 (±4.65) years. The duration of amenorrhea after the last menses among participants was between 1 and 28 years. Majority, 52.0%, had amenorrhea of 5 years and below where as 5.2 % had amenorrhea of ten years and above. Age of menopause varied significantly among participants with premature menopause (<40 years)reported in 10.0% (41) of them. Only 1.5% (6) had late menopause (≥55 yrs) while 47.3% (193) had menopause at ages 45-49 years and 12.5% (51) at age of 50-54 years. (Table 1)

Table 1. Age at menopause among post-menopausal women in Addis Ababa, Ethiopia, February to March 2024. (n-408)

Age at Menopause	Count	Percent (%)
<40	41	10.0%
40-44	117	28.7%
45-49	193	47.3%
50-54	51	12.5%
≥55	6	1.5%

Reproductive characteristics

The mean age at menarche of the participants was 14.68 (±1.44) years, and majority (91.2%) were in the age at or below 16 years, while the rest (8.8 %) had delayed menses. The reported age at giving first birth ranged 14 – 40 years while the mean age was 21.34 (± 4.681) years. Majority, 68.9%, were multiparous while 3.9% and 27.2% were nulliparous and primiparous respectively. Only 12.5 % had history of primary and secondary infertility. Menstrual pattern in the last four years before onset of amenorrheawas regular in 60.5%. More than half (51.7%) of the women used one or more type of modern contraceptive methods in their life time. Injectable, oral contraception pills, implants, IUCD and permanent methods were used by 26.2%, 21.1%, 15.0%, 7.6%, and 1.2% of the participants respectively. Past history of pelvic surgery was reported in 7.4% with cesarean section (3.7%) and myomectomy (2.5%) being the commonest.

Medical characteristics

Medical co-morbidities were reported during this period in 152 (37.25%) of the participants. Hypertension was the most frequent co-morbidity followed by diabetes mellitus andmusculoskeletal disorders reported in 91 (22.3%), 49 (12.0%) and 23(5.63%) of the participants, respectively. Other less common morbidities included RVI on ART 6 (1.5%) and cardiac diseases 4 (1%).

Peri-menopausal symptoms

Hot flushes was the commonest perimenopausal symptom experienced by almost half, 202 (49.5 %), of the participants. Night sweating 199 (48.8%), mood change 147 (36.0%), history of peri-menoausal weight gain 158 (38.7%) and sleep disturbance 128 (31.4%) were among the symptoms reported by participants. Although only 56 (27.7%) of those with hot flush were treated all improved after treatment. Similarly; though only 29.6% of participants with night sweatiness were treated nearly all (55/56) improved with treatment. Those who had mood change (depression, easily irritable) and seek care were 38 (9.3%) and for those group who were treated the symptom improved markedly in 35 (92.1 %). Participants who had history of weight gain and treated were 48 (11.8%), symptom improved markedly 46 (95.8 %). Participants who had history of sleep disturbance (insomnia) and treated were 30 (7.4%), symptom improved markedly in 26 (86.7%). In the majority of cases the frequency of symptom and health seeking behavior is unbalanced being only less than one third of all. (Table 2)

Only 214 (52.5%) of participants were sexually active. The reason for the sexually inactive was lack of desire in 71 (17.4%). Minority 15 (21.1 %) of those with lack of sexual desire were treated and most 13 (86.6%) improved. Among sexually inactive majority, 139 (71.6%), were widowed or divorced. The reason for sexual inactivity wasvaginal dryness and burning sensation in 63 (32.4%), and among them 16 (25.4%) were treated and 12 (75%) of the treated improved. (Table 2)

Table 2. Peri-menopausal symptoms experienced by post-menopausal study participant women in Addis Ababa, Ethiopia, February to March 2024. (n-408)

Variable		Frequency	Percent (%)
Had symptoms of hot flush	No	206	50.5
	Yes	202	49.5
Seek care for the hot flush (n-202)	No	146	72.3
	Yes	56	27.7
Did take treatment for the hot flush (n-56)	No	1	1.8
	Yes	55	98.2
The symptom improved after treatment (n-55)	No	0	0
	Yes	55	100
Had night sweatiness	No	209	51.2
	Yes	199	48.8
Did seek treatment for the night sweatiness (n-199)	No	140	70.4
	Yes	59	29.6
Did take treatment for the night sweatiness (n-59)	No	3	5.1
	Yes	56	94.9
The symptom improved after treatment (n-56)	No	1	1.8
	Yes	55	98.2
Had experienced mood change	No	261	64.0
	Yes	147	36.0
The mood change needed treatment (n-147)	No	109	74.1
	Yes	38	25.9
Took treatment for the mood change (n-38)	No	2	5.3
	Yes	36	94.7
The mood change improved after treatment (n-36)	No	1	2.8
	Yes	35	97.2
Had history of weight gain	No	250	61.3
	Yes	158	38.7
Did seek treatment for weight gain (n-158)	No	110	69.6
	Yes	48	31.4
Did receive treatment for the weight gain (n-48)	No	0	0
	Yes	48	100
Did weight gain improve after treatment (n-48)	No	2	4.2
	Yes	46	95.8
Faced sleep disturbance (insomnia)	No	280	68.6
	Yes	128	31.4
Did insomnia need treatment (n-128)	No	98	76.6
	Yes	30	23.4
Did receive treatment for the insomnia (n-30)	No	1	3.3
	Yes	29	96.7
Did the insomnia improve after treatment (n-29)	No	3	10.3
	Yes	26	89.7
Currently sexually active	No	194	47.5
	Yes	214	52.5
Sexually inactive due to lack of desire (n-194)	No	123	63.4
	Yes	71	36.6
Needed treatment for sexual desire (n-71)	No	55	77.5
	Yes	16	22.5
Received treatment for lack of sexual desire (n-16)	No	1	6.3
	Yes	15	93.7
Did lack of sexual desire improve after treatment (n-15)	No	2	13.3
	Yes	13	86.7
Sexually inactive due to vaginal dryness (n-194)	No	131	67.5
	Yes	63	32.5
Did vaginal dryness needs medical care (n-63)	No	47	74.6
	Yes	16	25.4
Did you receive treatment for vaginal dryness (n-16)	No	0	0
	Yes	16	100
Did the dryness improve after treatment (16)	No	4	25
	Yes	12	75

Factors affecting age at menopause

Independent variables having a p-value of <0.2 in bivariate logistic regression were transferred to multivariable logistic regression. Accordingly; family income, parity and Implant contraceptive usewere included in bivariate and then multivariable regression analysis. After multivariable logistic regression parity and implant use remained to be significantly associated with age at menopause.

Multiparty was significantly associated with 3.5 times higher odds of age of menopause of ≥ 45 yrs (AOR= 3.4, 95%CI=1.138-9.796) compared to nulliparous women. Previous implant contraceptive use was also significantly associated with 2.6 times higher odds of age of menopause of ≥ 45 yrs (AOR= 2.05, 95%CI=1.033-4.058) than non-users. (Table 3)

Table 3: Regression analysis of selected socio-demographic and reproductive variables Vs Age at menopause of ≥ 45 yrs at health facilities of participant post menopausal women, Addis Ababa, Ethiopia, Feb-March, 2024. GC. (n=408)

Characteristics	Adjusted prevalence of age at menopause of ≥45 yrs	OR for age at menopause of ≥ 45 yrs COR** P-value	95% CI	AOR*** P-value	95% CI
Family income (USD)					
< 50	57.3	1		1	
50-100	66.7	0.076	1.493 (0.960-2.322)	0.196	1.366 (0.851-2.192)
>100	66.7	.272	1.493 (0.731-3.049)	0.377	1.422 (0.652-3.102)
Parity					
0	37.5	1		1	
1	46.8	0.485	1.469 (0.500-4.319)	0.478	1.489 (0.496-4.471)
>1	68.3	0.016	3.596 (1.267-10.202)	0.028	3.339 (1.138-9.796)*
Implant use					
No	58.2	1		1	
Yes	78.7	0.003	2.650 (1.385-5.31071)	0.040	2.048 (1.033-4.058)*
IUCD					
No	60.4	1		1	
Yes	82.4	0.082	3.065 (0.867-10.841)	0.09	3.067 (.841-11.185)

*P<0.05, **COR – Crude Odds Ratio, ***AOR –Adjusted Odds Ratio

DISSCUSSION

Menopause is an inevitable occurrence during women's life. Natural age at menopause differs across the world and literature search reveled higherage in developed countries and lower in developing countries. The mean age of menopause in our study was 45 years. This finding is lower compared to many reports from developing countries and local studies. It is lower than previous local study reports of 46.7 years done in rural town Dangila and 48.78 years in Hawassa.[5, 6] However it is slightly higher than the 44.18 years mean age reported from a study done in Bahir Dar.[6] Our finding is also lower compared to reports from other countries like Nigeria (46.16 yrs), Iran (49.2yrs), Russia (50 yrs), China (48.4 yrs) and Jordan (48.5yrs) studies.[8,18,20-22] The difference for the result could partly be due to population difference.

Reports based on the limited available population-based data revealed premature menopause to occur in approximately 1% – 8.6% and early menopause in 4.9%–9.4% of women.[23-26] In the current study the prevalence of pre mature menopause (age of menopause before 40 years) and earlier menopause were 10.0% and 28.7% respectively which were higher than prior reports.[23-26] Our findings are also higher compared to large scale population based study done in China with 3.40% of premature menopause and 6.75% early menopause.[18] These differences could be due to methodology and socioeconomic status differences. Our study was a cross sectional while the above were longitudinal population based studies.

In the present study, almost half of the participants were asymptomatic while 202 (49.5 %) had hot flushes, 199 (48.8%) night sweating, 147 (36.0%) mood change, 158 (38.7%) history of weight gain and 128 (31.4%) faced sleep disturbance (insomnia). These findings are lower compared to a local study report which reported hot flushes in 65.9%, difficulty falling asleep in 49.6%, and depressive mood in 46.0%.[13] Similarly Indian and Chinese studies reported 80% and 40.8% mood disorder and 53.8% insomnia prevalence. On the other hand these studies reported lower prevalence of hot flushes with prevalences of 36.7% and 36.6% respectively.[14, 27] These differences in prevalence of symptoms potentially are related to racial differences.

Parity >1 (p= 0.022) and implant use (p=0.039) were found to be associated with age of menopause of >45yrs. Mean age of menopause of ≥ 45yrs was more than three times more likely in women with parity of greater than one (AOR=3.34, 95% CI; 1.14 -9.79). This finding is in line with many prior reports.[8, 12, 16-18,28] Similarly the odds of mean age of menopause of ≥ 45yrs was more than two times in those with use of Implant (AOR=2.05, 95% CI; 1.03 – 4.06). The finding is similar to previous studieson AAM in those using hormonal contraceptive methods.[17, 18, 20, 22] Unlike most prior studies OCP use in present study was not significantly associated with AAMmost likely due to shorter period use of OCP in our study without having the desired effect of prolonged ovarian suppression.

Many factors reported to influence the age of menopause were not seen to have effect on age at menopause in the current study. Unlike Greece and Chinese studies onoccupational statusof being a house wife didn't show the advantage of greater age of menopause, compared to those who are earning on heavy daily activity civil servants and business women.[15, 19] Intake of caffeine was also not found to be related to age of menopause. A similar finding among visitors of Hospitalized patients, caffeine consumption up to 1 cup /day was not found to affect age of menopause.[19] Those who abstain from alcohol consumption didn't show early age of menopause significantly and the finding is similar to Greece study.[19, 22] These differences could be related to the difference in the amount of coffee and alcohol consumption. Women in our study mostly consume local low alcohol concentration and less concentrated traditional coffee.

In our study unlike prior reports low educational status, early age of menarche and older age at first birth didn't show correlation to the early age of menopause.[18, 26] According to a prior study; current smoking, underweight, higher physical activity, earlier age at menarche and older age at first birth were associated with earlier age at natural menopause.[18] Age of menarche did not show significant difference by age category but twostudies in Norway, the late age of menarche more than 16 years, being parous women related to higher age of menopause.[16, 17]

Many prior studies in different countries showed that timing of menopause is influenced by many factors including genetic, diet, life style, reproductive history, body composition, general health condition, social status, level of income, education status and occupation.[8, 12, 15, 18, 29] Indian study also showed that marital status, poverty, religious, illiteracy, having never used contraceptive pills and low parity to be associated with early menopause.[28] Our finding did not demonstrate significant association of age at menopause with marital status, education, occupation, level of income, religion and ethnicity. No woman was found to smokein our study, which is a well known risk factor for early age of menopause independently.[15, 18, 21]

Strength and Limitation of the study

The strength study is that it identifies the burden of one of the neglected health issue in the country. Being a cross sectional retrospective study the main limitations is the recall bias. The other limitation is that it cannot represent the national scenario as it is done in an urban set-up only.

Conclusions and recommendations:

The mean age of menopause in our study was 45 years. The prevalence of pre mature menopause was 10.0% which is higher than most prior reports. Hot flushes was the commonest menopausal symptom. Only less than a third of women who had menopausal symptoms consulted a health provider for treatment and care. This potentially is due to lack of knowledge on availability of treatment for menopausal symptoms. Parity and use of Implants were significantly associated with age at menopause of ≥ 45yrs. Large population based studies are recommended to better identify factors associated with lower mean age at menopause and high prevalence of premature menopause in the study area.. The newly identified association between age at menopause and Implant also needs further well designed study. Awareness creation on menopause in the population should be done to increase their health seeking behavior and minimize the risks and disease that are associated with menopause.

Ethical approval and consent to participate:

Ethical approval for the study was obtained from the Institutional Review Board (IRB) of Dept. of Obstetrics and Gynecology, College of Health Sciences, Addis Ababa University (Ref. No: DRPC 2024/01/03). Permission was also obtained from the study facilities to collect data. Informed consent was acquired from every participant before participation.

List of abbreviations:

AAM: Age at Menopause;
EM: Early Menopause;
PM: Premature Menopause;
OCP: Oral Contraceptive Pills;
EDHS: Ethiopian Demographic and Health Survey;
SVD: Spontaneous Vaginal Delivery

Authors contributions:

BB contributed to the conception of the study, design, data collection, analysis, interpretation of the data and write-up of the manuscript. EK was involved in the conception, design, analysis, and write-up of the final manuscript. AG was involved in design, discussion and manuscript review. All authors read and approved the final manuscript.

Availability of data:
The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest:
The authors declare that they have no competing interests.

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