

## Socioeconomic Adversities During Life Course and Menopause Onset in a Developing Country

Adama Faye\*, Christelle Nikiema and Anta Tal-Dia

*Institut of Health and Development, Cheikh Anta Diop University, Dakar-Fann, Dakar, Sénégal*

\*Corresponding author: Adama Faye, Institut of Health and Development, Cheikh Anta Diop University, Dakar-Fann, Dakar, Sénégal, Tel: 0022182498 78; E-mail: adama.faye@ucad.edu.sn

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### Abstract

**Background:** The age of natural menopause varies considerably between countries and within countries. This variation is related to socio-economic conditions. The objective is to assess the effect of socioeconomic conditions on the age of the natural menopause in postmenopausal women aged 40 to 80 years.

**Method:** A cross-sectional study was conducted involving women aged 40–80 years living in Burkina Faso in 2014. The cluster sampling in two stages has been carried out. The dependent variable was the age at menopause and the independent variables were the current socioeconomic and childhood conditions, the health and nutrition conditions during childhood and the gynaeco-obstetric history. The analysis was performed by a multivariate Cox model.

**Results:** A total of 600 women aged 40 to 80 years were interviewed. The average age at menopause was 47.10 years ( $\pm 4.98$ ). Socio-economic factors associated with menopausal age are: marital status, place of residence and parents' home status, the education level and the women's transport means. The risk of having a premature menopause is higher in women who cumulate at least four socioeconomic disadvantages (HR=2.67 [1.90, 3.75] 95%) compared to those who do not.

**Conclusion:** the socio-economic difficulties during childhood and adulthood are linked to the age of natural menopause. It is crucial to raise the level of education, and improve the living conditions of the population.

**Keywords:** Menopause; Socioeconomic adversity; Survival; Burkina faso

### Introduction

WHO defines menopause as permanent cessation of menstruation resulting from loss of ovarian follicular activity. The loss of ovarian follicular activity causes a decrease resulting to a cessation of the production of estrogen by the ovaries. The onset of menopause may be associated with many functional symptoms and complications that are often ignored by women [1-3]. The age at menopause is a main indicator of the standards of life [4]. Menopause usually occurs between 45 and 55 years. When it is early, it can increase the risk of premature biological aging and the onset of certain diseases such as osteoporosis [5]. When it is late it may improve cognitive disorders seen after menopause [6]; on the other hand it increases the risk of breast cancer occurrence and endometrium [7]. The age of menopause varies considerably from continent to continent: between 48 and 50 years in Latin America [8], 51.4 years in the USA [9], 54.3 years in Europe [10] and 48.0 in Africa [11]. This variability in age of menopause among populations is mainly due to socio-economic conditions, gender, lifestyle and heredity [8,12,13]. Women living with better socioeconomic conditions have a higher average age of menopause compared to those living in more difficult socio-economic conditions [13]. Several studies have shown the links between socio-economic conditions in childhood and adulthood and the age of natural menopause. Vélez et al. in Latin America [8] found that early

menopause occurred more among women who accumulated six socioeconomic disadvantages than women without any socioeconomic disadvantage. Debbie et al. in the UK [12], have shown the cumulative effect of socio-economic disadvantage on the age of natural menopause from 10 indicators during childhood and adulthood life course. Thus, the cumulative trajectory of several socio-economic disadvantages throughout life can also help to explain the occurrence of early menopause [8,12]. However, few studies have addressed the cumulative nature of the socio-economic difficulties on the age of menopause in Africa. Knowledge of existing links will help focus on the determinants to prevent the occurrence of early menopause. This prevention will improve women's health in post-menopausal period. The general objective of this study is to show the link between socio-economic conditions and the age of natural menopause in women aged 40 to 80 years.

### Methods

#### Study population

Burkina Faso is a landlocked country in the heart of West Africa with its capital Ouagadougou. It occupies an area of 274 000 Km<sup>2</sup> with a population estimated in 2010 to 15 730 977 inhabitants according to the updated RGPH 2006 of which 52% women [14]. Life expectancy at birth was 51 years for men and 54 years for women (52 years on average). This cross-sectional study was based on women aged 40-80 years living in and around Koudougou, selected by cluster sampling.

The city of Koudougou is located 100 km west of Burkina Faso's capital Ouagadougou. Each village or neighbourhood of Koudougou constituted a sector and, depending on its size, a sector could contain one or several clusters. The number of subjects required was estimated at 600 according to the following formula, where  $p$  is the level of knowledge about menopause.

$$n = \epsilon^2 \times [p(1-p)] / i^2, \epsilon=1,96; p=0.41 [11].$$

et  $i = 0.05$ , with a cluster effect of 1.5 and a response rate of 92%.

### Measurement of study variables

Data were collected through individual interviews in the homes of women; the interviews were conducted by trained interviewers after informed consent.

Menopause status was assessed via the question: At what age did your last menstrual period occur? For all women, at least 1 year had elapsed between the last menstrual period and their age at the time of interview. Childhood socioeconomic adversities were assessed via the following questions: During the first 15 years of your life: what was your family's economic situation? Was your health good, average or poor? Did you live in rural areas? And were there times when you went hungry?

Adult socioeconomic adversities were determined by the respondent's education and marital status and lifelong occupation and the disponibility of transportation. Four levels were used to measure education: no schooling, primary, some secondary, and postsecondary. Reproductive factors included data about the number of children. Parity was categorized as follows: 0 to 5 children, 6 to 10, eleven or more children.

The cumulative effect of adverse socioeconomic status across the life course on age at menopause was assessed by generating a life course socioeconomic status score from the six indicators (four childhood conditions, education, and occupation) by giving equal value to each. The score ranged from 0 (most advantaged position across the life course) to 6 (most disadvantaged position across the life course).

### Statistical analysis

Descriptive analyses of the distribution of life course socioeconomic conditions, behavioral, reproductive, and childhood environmental factors were performed. The median of age at natural menopause were estimated by Kaplan-Meier survival analysis. In a first step, bivariate analyses using the log-Rank test were used to identify associations between age at natural menopause and independent factors.

All significant variables at the 0.25 [15] level in the univariable analysis were included in the multivariable proportional hazard model assessed by Cox proportional hazard models using a step-down procedure. Data analysis was performed with R statistical software.

### Results

A total of 600 women were surveyed. The average age of women was 56.9 years (8.6). There were 5 non-respondents. A total of 97.83% of the women surveyed knew their age at menopause. The mean age of menopause was 47.1 years (4.9). The median was 47 years. Half of the women lived in the city. The house belonged to the household in 72.7% and they were made of earth in 77.7% of the cases. They had no equipment in 80% and transportation means in 79.9%. The economic situation during childhood was perceived as good 18.8%; 67.7% of the

interviewed women reported experiencing hunger during their childhood; 67.8% had less than three meals per day, and 20.6% had a negative perception of their health.

48.8% of the interviewed women were married among them 30% were polygamous and 44.7% had no education. They were housewives in 32.5%. The current economic situation was perceived as good in 13.3%. They had no means of transport in 78.3%.

The average age of the menstruation was 15.6 years ( $\pm 1.9$ ). The average number of children per woman was 6.6 ( $\pm 2.6$ ) and 64.2% were older than 5 years. The mean age at first birth was 20.5 years ( $\pm 2.6$ ). 8% of the interviewed women used contraceptive methods.

Nearly 43.7% did sport regularly, 25.7% drank coffee regularly, 21.5% drank tea, and 58.8% took alcohol and 9.0% smoked tobacco.

Table 1 shows the results of the log-rank test. Women who lived in the village and whose houses were built of earth had earlier menopause. It is the same for women whose economic situation was considered bad, their childhood difficult or their homes not equipped.

	N	Median	p-value
Childhood situation			
Residence			0.00049
Rural	282	47	
Urban	305	48.5	
Type of House			0.0005
Clay	454	46.66	
Cement, wood or other	133	48.57	
Number of equipment present in the parents			0.92
0	480	47.1	
$\geq 1$	107	47	
Socio-economic status			0.051
Good	108	47.3	
Bad	479	46.18	
Hunger during childhood			0.37
Yes	397		
No	190		
Number meals a day			
1	57	46.7	
2	221	47.25	
$\geq 3$	188	47.06	
Perceived health			0.02
Bad	121	46.16	
Good	466	47.33	
Gyneco-obstetrical situation			
Marital Status			0.0001

Married	347	47	
Non married	33	45	
Veuve	207	48	
Contraception			0.43
Yes	46	47.65	
No	541	47.04	
Age of menarche (years)			0.0013
<15	166	46.04	
≥ 15	418	47.51	
Number of children			0.00022
0-5	210	46.28	
10-Jun	335	47.29	
≥ 11	42	49.59	
Age at first birth (years)			0.35
≤ 20	347	47.28	
>20	222	46.89	
Life habits			
Physical activity			0.98
Yes	259	47.09	
No	328	47.1	
Coffee			0.24
Yes	147	46.6	
No	440	47.23	
Tea			0.48
Yes	126	47.25	
No	461	46.67	
Alcohol			0.35
Yes	344	47.25	
No	243	46.87	
Smoking			0.91
Yes	52	46.96	
No	535	47.11	
Current situation			
Housewife			0.0058
Yes	190	46.27	
No	397	47.48	
Current economic situation			0.014
Good	78	48.76	

Average or bad	509	46.84	
Type of house inhabited			0.028
House owner	424	47.41	
Occupant	80	46.88	
Other	83	45.89	
Number of equipment in the house			0.012
0	207	46.4	
≥ 1	380	47.47	
Personal transportation			0.0023
Yes	465	47.41	
No	122	45.87	
Education			0.013
None	261	46.71	
Primary	118	47.05	
Secondary	183	47.26	
University	25	50.08	

**Table 1:** Personal characteristics and age at menopause (LogRank test).

Marital status and the number of children were related to the age of menopause. Age was also linked to the current economic situation. There is no association between the age of menopause and the nutritional and behavioral factors.

The median age of natural menopause was 48.54 years for those who have no cumulative socio-economic disadvantage and 45.12 years for those with at least four cumulative socio-economic disadvantages.

The multivariate analysis showed that the age of natural menopause is linked to marital status. Women who live in cities have a risk 1.21 times greater. The same result was also found with the type of home and health status during childhood.

The risk increased with the number of children and decreased with education level. The results in the (Tables 2 and 3) show a gradient in the relationship between the menopause and the number of disadvantages. The more disadvantages there are, the earlier the menopause onset.

Number of socioeconomic's adversities	N	Median	p-value
0	77	48.54	0.00005
1	158	47.93	
2	141	46.85	
3	132	46.68	
≥ 4	79	45.12	

**Table 2:** Number of socioeconomics' adversities and age at menopause (LogRank test).

Variables	HR adjusted (IC95%)
Marital status	
Not married	1
Married	0.66 (0.52; 0.81)
Veuve	0.52 (0.36; 0.77)
Childhood residence	
Urban	1
Rural	1.21 (1.01; 1.45)
Parents type of house	
Clay	1
Cement, wood or other	0.68 (0.54; 0.84)
Difficult childhood	
No	1
Yes	1.42 (1.10; 1.84)
Age at menarche (years)	
≥ 15	1
<15	1.37 (1.14; 1.65)
Number of children	
≥ 11	1
6-10	1.58 (1.14; 2.18)
0-5	2.00 (1.42; 2.83)
Education	
None	1
Primary	1.03 (0.81; 1.32)
Secondary	0.99 (0.79 ; 1.24)
University	0.58 (0.36 ; 0.93)
Personal transportation	
Yes	1
No	1.46 (1.16; 1.84)
Number of socioeconomic adversities	
0	1
1	1.42 (1.06; 1.89)
2	1.66 (1.23; 2.23)
3	1.90 (1.40; 2.58)
≥ 4	2.67 (1.90; 3.75)

**Table 3:** Socioeconomics' adversities and age at menopause (Cox multivariate analysis).

## Discussion

The results of our study show a mean age of 47 years and that the main factors associated with the age of natural menopause are personal characteristics, socioeconomic factors and accumulated socio-economic disadvantages. The median age of natural menopause found is comparable to results found in Mexico [16], Latin America [8], Ghana [11] and Nepal [17]. On the other hand Gold et al. [9] in the US, Toshiyuki [18,19] in Japan and Dratva and al [20] found in Europe respectively a median age of 51.4, 52.1 and 54.3 years. This variation reflects the disparities among countries with a very high living standard of living and those with low living standards.

The effect of marital status on the age of natural menopause differs according to the studies. In our study, the age of natural menopause is higher in widowed and married women than in unmarried women. Gold [9] in the US found that women who had never been married and those separated, divorced and widowed have an earlier menopause than married women. Kaczmarek Poland [19] did not find any difference according to marital status. In our study, there is a link between gender and age of natural menopause. Studies such as those of Kaczmarek Poland [19], Garrido-Latorre in Mexico [16] have also established a link between high parity and the late onset of natural menopause. Nulliparous women have much earlier onset of menopause due to the ongoing activity of the ovaries with a depletion of ovarian follicles [20,21]. Kaczmarek [19] found that natural menopause occurs earlier in women who had their menarche before 14 years. This is comparable to ours. The early onset of menarche also causes the depletion of ovarian follicles [22,23].

The socioeconomic characteristics of parents who are related, after adjustment, with the age of natural menopause are the dwelling place, the type of home and parental transportation. The dwelling place can influence the age of natural menopause; this may be due to the higher level of development in cities. Several studies have demonstrated the association between early socio-economic disadvantages of life and age of natural menopause [12]. Socio-economic difficulties of childhood incur a cascade of events that influence the modulation of the depletion of ovarian follicles and growth of children [24]. We have not found a link between nutritional characteristics during childhood and age of natural menopause Velez [8]. This could be because it is difficult to judge the quantity and quality of food consumed during childhood. However, the perception of an excellent state of health during childhood promotes a late menopause [19]. The poor health affects child growth and the development of ovarian follicles. The concept of difficult childhood triggers earlier onset of natural menopause. This may be due to stress which acts on hormone regulation which will influence the rate of decline of ovarian follicles.

The level of education and the woman's transportation means are the socio-economic factors of adulthood which, even after adjustment is significantly associated with the age of natural menopause. Many studies have also found an association between the level of education and the age of natural menopause [19,25,26]. This could be explained by the higher level of these women's lives (good social position, better management of the health, better food in quantity and quality). Also, the low living conditions favors stress that leads to disturbances of the reproductive function [27].

Our study shows that the combination of socio-economic disadvantages, from childhood to adulthood gradually increases the risk of an earlier menopause onset. Velez et al. [8] found similar results in America, and Debbie [12] also found a link between the age of

natural menopause and the accumulated socio-economic disadvantages, despite the different scores of each study. So it is not the socioeconomic conditions during childhood only or during adulthood only which acts on the age of natural menopause but the combination of the two factors.

## Conclusion

The age of menopause varies greatly in different parts of the world. When it occurs early, it limits the reproductive capacity of the woman but can also increase the occurrence of cardiovascular diseases. The results of our study show that the economic determinants of childhood and adulthood are the major determinants. There is an dire need to improve the living conditions during childhood and adulthood.

## References

1. Cissé CT, Diouf AA, Dieng T, Dieye AG, Moreau JC (2008) Ménopause en milieu africain: épidémiologie, vécu et prise en charge à Dakar. *Gynéco venue d'ailleurs* 335: 6-10.
2. Velasco-Murillo V, Fernández-Gárate IH, Ojeda-Mijares RI, Padilla-Vallejo I, De la Cruz-Mejía L (2007) Knowledge, experience and behavior at climacteric and menopause stages among family medicine female users at IMSS. *Rev Med Inst Mex Seguro Soc* 45: 549-556.
3. Faye A, Ka O, Nickiéma C, Leye MM, Tal-Dia A (2014) Knowledge of signs and complications of menopause among women in Burkina Faso. *Int J Gynecol Obstet* 124: 257-259.
4. Thomas F, Renaud F, Benefice E, De Meeus T, Guegan JF (2001) International variability of ages at menarche and menopause: patterns and main determinants. *Hum Biol* 73: 271-290.
5. Stone K, Bauer DC, Black DM, Sklarin P, Ensrud KE (1998) Hormonal predictors of bone loss in elderly women: a prospective study: The Study of Osteoporotic Fractures Research Group. *J Bone Miner Res* 13: 1167-1174.
6. McLay RN, Maki PM, Lyketsos CG (2003) Nulliparity and late menopause are associated with decreased cognitive decline. *J Neuropsychiatry Clin Neurosci* 15: 161-167.
7. Kelsey JL, Gammon MD, John EM (1993) Reproductive factors and breast cancer. *Epidemiol Rev* 15: 36-47.
8. Velez MP, Alvarado B, Lord C, Zunzunegui MV (2010) Life course socioeconomic adversity and age at natural menopause in women from Latin America and the Caribbean. *Menopause* 17: 552-559.
9. Gold EB, Bromberger J, Crawford S, Samuels S, Greendale GA (2001) Factors associated with age at natural menopause in a multiethnic sample of midlife women. *Am J Epidemiol* 153: 865-874.
10. Dratva J, Gomez RF, Schindler C, Ackermann-Liebrich U, Gerbase MW, et al. (2008) Is age at menopause increasing across Europe? Results on age at menopause and determinants from two population-based studies. *Menopause* 16: 385-394.
11. Kwawukume EY, Ghosh TS, Wilson JB (1993) Menopausal age of Ghanaian women. *Int J Gynaecol Obstet* 40: 151-155.
12. Lawlor AD, Shah E, George DS (2003) The association of socio-economic position across the life course and age at menopause: the British Women's Heart and Health Study. *BJOG* 110: 1078-1087.
13. De Bruin JP, Bovenhuis H, Van Noord PA, Pearson PL, Van Arendonk JA, Te Velde ER, et al. (2001) The role of genetic factors in age at natural menopause. *Hum Reprod* 16: 2014-2018.
14. Hosmer Jr DW, Lemeshow S (2012) *Applied Logistic Regression*. 2nd ed. New York, NY: John Wiley & Sons.
15. Ministry of Economy and Finance / National Institute of Statistics and Demography (INSD) / General Population and Housing Census 2006 (2008) Final results. Burkina Faso: INSD.
16. Garrido-Latorre F, Lazcano-Ponce EC, Lopez-Carrillo L, Hernández-Avila M, (1996) Age of natural menopause among women in Mexico city. *Int J Gynecol Obstet* 53: 159-166.
17. Thomas F, Renaud F, Benefice E, De Meeus T, Guegan JF (2001) International variability of ages at menarche and menopause. *Patterns and main determinants*. *Hum Biol* 73: 272-290.
18. Yasui T, Hayashi K, Mizunuma H, Kubota T, Aso T, et al. (2012) Factors associated with premature ovarian failure, early menopause and earlier onset of menopause in Japanese women. *Maturitas* 72: 249-255.
19. Kaczmarek M (2007) The timing of natural menopause in Poland and associated factors. *Maturitas* 57: 139-153.
20. Stanford JL, Harge P, Brinton LA, Hoover RN, Brookmeyer R (1987) Factors influencing the age at natural menopause. *J Chronic Dis* 40: 995-1002.
21. Whelan EA, Sandler DP, Mc Connaughey DR, Weinberg CR (1990) Menstrual and reproductive characteristics and age at natural menopause. *Am J Epidemiol* 149: 612-620.
22. Meschia M, Pansini F, Modena AB, De Aloysio D, Gambacciani M, Parazzini F, et al. (2000) Determinants of age at menopause in Italy; results from a large cross-sectional study. *Maturitas* 34: 119-125.
23. Varea C, Bernis C, Montero P, Arias S, Barroso A, et al. (2000) Secular trend and intrapopulation variation in age at menopause in Spanish women. *J Biosoc Sci* 32: 383-393.
24. Hardy R, Kuh D (2005) Social and environmental conditions across the life course and age at menopause in a British birth cohort study. *BJOG* 112: 346-354.
25. Luoto R, Kaprio J, Uutela A (1994) Age at natural menopause and sociodemographic status in Finland. *Am J Epidemiol* 139: 64-76.
26. Berga SL (1993) How stress can affect ovarian function. *Contemp Obstet Gynecol* 6: 87-94.
27. Chrousos GP, Torpy DJ, Gold PW (1998) Interactions between the hypothalamic-pituitary-adrenal axis and the female reproductive system: clinical implications. *Ann Intern Med* 129: 229-40.