

Assessment of contributing risk factors for premature menopause in Bangladesh: Cox proportional hazard model analysis

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A – Study Design, B – Data Collection, C – Statistical Analysis, D – Data Interpretation, E – Manuscript Preparation, F – Literature Search, G – Funds Collection

Summary Background. Premature menopause has received much attention due to the increased life expectancy of women. It is harmful for women's lives, and it brings changes in women's behaviour. No study has been carried out in Bangladesh concerning premature menopause based on a national survey.

Objectives. The aim of this study was to explore the scenario of premature menopause among Bangladeshi women and to identify the risk factors associated with premature menopause.

Material and methods. In this study, we considered secondary data from the Bangladesh Demographic and Health Survey (BDHS) 2014. Data was collected from 17,863 ever-married women within the reproductive age of 15–49 years using two-stage stratified cluster sampling. The BDHS report showed that a women could not experience menopause before the age of 30 years. Thus, we took into consideration 9,336 women 30 years of age and above. After deleting the missing values and usual observations, 8,885 samples were considered for our final analysis. The Log-rank test and Cox proportional hazard model were used for statistical analysis.

Results. The results showed that region, educational attainment, wealth index, employment status, marital status and contraceptive method use status were statistically significant risk factors for premature menopause in Bangladesh.

Conclusions. From the entire study, it was confirmed that there were several risk factors for premature menopause in Bangladesh.

Key words: premature menopause, Bangladesh, regression analysis.

Afrose S, Ahmed NF, Khatun MF, Ali M. Assessment of contributing risk factors for premature menopause in Bangladesh: Cox proportional hazard model analysis. *Fam Med Prim Care Rev* 2020; 22(3): 193–196, doi: <https://doi.org/10.5114/fmpcr.2020.98240>.

Background

Menopause is the permanent cessation of menstruation due to the loss of ovarian follicular activity, which is diagnosed when a woman has gone without period for a year [1, 2]. Naturally, it occurs in a woman's life between the age of 45 to 55 years [3]. During this period, the ovaries begin to decrease the production of the sex hormones oestrogen and progesterone, which is a normal part of aging [1, 4]. When menopause occurs before the age of 40 years, it is referred to as premature menopause [5].

In the current era, premature menopause is a major concern for midlife women in South East Asia, including Bangladesh [6]. Most of the women are uneducated and have no consciousness about premature menopausal status [7]. In Bangladesh, 74.4 years was the approximate average lifespan of women, and the average age of natural menopause was 51.14 years [8, 9]. Now-a-days, the study of premature menopause has received much attention due to the increased life expectancy of women [10].

Numerous epidemiological studies have showed that women who experience premature menopause have a higher risk of overall mortality, cardiovascular diseases, neurological diseases, psychiatric diseases, osteoporosis, etc. [11–16]. The age of menopause was associated with reproductive, demographic, socio-economic, lifestyle and cultural factors [17, 18]. To our best knowledge, there has been no study to determine the prevalence and associated risk factors of premature menopause in Bangladesh.

Objectives

The aim of the study was to explore the premature menopausal scenario among Bangladeshi women and to identify the risk factors associated with premature menopause.

Material and methods

Data

Data was extracted from the nationally representative Bangladesh Demographic and Health Survey (BDHS), which was conducted in 2014. The BDHS used two-stage stratified cluster sampling, and data was collected from 17,863 ever-married women within the reproductive age of 15–49 years. A detailed description of the survey design, questionnaires and related information can be found elsewhere [19]. The BDHS report showed that a women could not experience menopause before the age of 30 years [19]. For this reason, we took into consideration 9,336 women 30 years of age and above. After deleting the missing values and usual observations, 8,885 samples were considered for our final analysis.

Outcome variable

Menopausal status and the current age of the women were available in the BDHS, 2014 data.

We considered current age as a proximate measurement of lifetime for survival analysis, because there was no exact menopausal age in our data. A menopausal woman was considered as premature menopausal if her current age was at most 40 years.

Independent variables

In this study, we considered region, religion, place of residence, educational attainment, wealth index, employment status, marital status, BMI and contraceptive method use status as independent variables.



Statistical analysis

The Log-rank test was used to assess the association between premature menopausal status and independent variables. The Cox proportional hazard model was used to identify the significant risk factors associated with premature menopause. All analyses were carried out by SPSS 20.

Ethical approval

The BDHS data was approved by the Bangladesh medical research council, and informed consent was taken from the participants.

Results

The samples mean age in this study was 38.60 ± 5.74 years (ranging from 30 to 49). Approximately 4.80% of women had premature menopause. Table 1 illustrates the characteristics of the women. Table 2 represents the *p*-values obtained from the Log-rank test for assessing the association between premature menopausal status and selected explanatory variables. It was found that region, place of residence, educational attainment, wealth index, marital status and contraceptive method use status were significantly associated with premature menopausal status at *p* < 0.05. The variables found significant were considered for the Cox proportional regression analysis. The hazard ratios and *p*-values obtained from the Cox proportional hazard model are presented in Table 3. The results showed that women who lived in the Khulna region had a 1.91 times higher chance to experience premature menopause compared to their counterparts. Table 3 depicts a 0.57 times lower chance of premature menopause among higher educated women compared to non-educated women. The analysis revealed that wealthy women had a 0.29 times lower chance to experience premature menopause compared to poor women. It was found that employed women were 1.24 times more likely to experience premature menopause than unemployed women. A woman who was widowed/divorced/separated had a 0.54 times lower chance to experience premature menopause than married women. Table 3 shows that women who used a contraceptive method had a 0.29 times lower chance to experience premature menopause than their counterparts.

Variables	Categories	<i>n</i>	%
Region	Barisal	1,069	12.0
	Chittagong	1,329	15.0
	Dhaka	1,483	16.7
	Khulna	1,385	15.6
	Rajshahi	1,336	15.0
	Rangpur	1,266	14.2
	Sylhet	1,017	11.4
Place of residence	urban	3,129	35.2
	rural	5,756	64.8
Educational attainment	no education	3,250	36.6
	primary	2,774	31.2
	secondary	2,199	24.7
	higher	662	7.5
Wealth index	poor	3,247	36.5
	middle	1,785	20.1
	wealthy	3,853	43.4

Employment status	unemployed	5,539	62.3
	employed	3,346	37.7
Marital status	married	8,088	91.0
	widowed/divorced/ /separated	797	9.0
Contraceptive method use status	no	3,555	40.0
	yes	5,330	60.0
BMI	under weight	1,450	16.3
	healthy weight	4,792	53.9
	over weight	2,095	23.6
	obese	5,48	6.2

Variables	Log-rank test <i>p</i>
Region	0.01*
Place of residence	< 0.001*
Educational attainment	0.01*
Wealth index	< 0.001*
Working status	0.01*
Marital status	0.01*
Contraceptive method use status	0.04*
BMI	0.32

* Indicates a significance at 5%.

Factors	<i>p</i>	HR	95% C.I. for EXP(B)	
			lower	upper
Region				
Barisal (ref)		1		
Chittagong	0.32	1.22	0.82	1.83
Dhaka	0.41	1.18	0.79	1.76
Khulna	< 0.001*	1.91	1.33	2.74
Rajshahi	0.19	1.29	0.88	1.91
Rangpur	0.10	1.38	0.94	2.03
Sylhet	0.76	0.93	0.59	1.46
Place of Residence				
urban (ref)		1		
rural	0.12	1.20	0.95	1.52
Educational attainment				
no education (ref)		1		
primary	0.73	1.04	0.83	1.31
secondary	0.53	1.09	0.83	1.43
higher	0.01*	0.43	0.22	0.83
Wealth index				
poor (ref)		1		
middle	0.55	0.93	0.72	1.19
wealthy	0.01*	0.72	0.55	0.93
Employment status				
unemployed (ref)		1		
employed	0.04*	1.24	1.02	1.50
Marital status				
married (ref)		1		
widowed/divorced/separated	< 0.001*	0.46	0.30	0.69
Contraceptive method use status				
no (ref)		1		
yes	0.01*	0.71	0.59	0.87

* Indicates a significance at 5%.

Discussion

The present study was conducted based on BDHS data and found that approximately 4.80% of women had experienced premature menopause, which was higher than similar previous studies [14, 18]. The results showed that women who lived in the Khulna region had a higher chance to experience premature menopause compared to other regions. Khulna is one of the coastal regions in Bangladesh, and people are adversely affected by salinity problems [20]. A study on the Khulna region showed that women's health status was adversely affected by drinking saline water [21]. This may be the cause for this findings. Policy makers should focus on the factors responsible for the highest rate of premature menopause in the Khulna region.

The results showed that educational attainment and wealth index were significantly associated with premature menopause. The results indicated that highly educated and wealthy women had less chance to experience premature menopause. These findings were similar to previous studies [22, 23]. Highly educated and wealthy women are more conscious about their health, and they have knowledge about the consequences of premature menopause [24]. This may be the cause for these findings.

The results also showed that employed women had a higher chance to experience premature menopause. Even now, in Bangladesh, employed women face several difficulties in their workplace that could be a contributing factor for premature menopause [25]. This may be the cause for these finding. We found that a woman's contraceptive method was associated with premature menopausal status. The findings were consistent with a prior prospective [26].

Married women had a higher chance of premature menopause than women who were widowed/divorced/separated, which was contradicted by the results of a former study conducted in United States [27, 28]. This could be due to socio-cultural variations.

Limitations of the study

This study has certain limitations. There is no exact age of menopause. We considered the current age of the women as a proximity measurement of menopausal age. Since this is a cross-sectional study, it is difficult to establish a causal relationship between premature menopause and selected independent variables, whereas a longitudinal study is more effective. Despite the above limitations, the findings of this study will contribute to understanding and identifying the associated risk factors of premature menopause in Bangladesh.

Conclusions

The study was conducted based on nationally represented data, and the findings revealed that region, educational attainment, wealth index, employment status, marital status and contraceptive method use status were significant risk factors for premature menopause in Bangladesh. Governments should take the necessary steps to enhance public awareness about the causes and consequences of premature menopause.

Acknowledgements. The authors would like to thank the authorities of the BDHS for granting permission to use their dataset in this research.

Source of funding: This work was funded from the authors' own resources.

Conflicts of interest: The authors declare no conflicts of interest.

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Received: 19.10.2019

Reviewed: 18.11.2019

Accepted: 11.05.2020

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