Association of Socio-economic and Demographic Factors withIndonesian Women's Premature Menopause: Analysis of theDemographic and Health Surveys Program (DHS) of 2017

by Vonny Khresna Dewi

Association of Socio-economic and Demographic Factors with Indonesian Women's Premature Menopause: Analysis of the Demographic and Health Surveys Program (DHS) of 2017

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ABSTRACT The research objective of this study was to analyse the influence of early menopause factors on Indonesian women with demographic and socio-economic indicators, such as age, wealth index, education, employment status, rural-urban settlements, including those associated with media exposure and smoking. The data used in this study were from the Indonesian Demographic and Health Survey in Indonesia in 2017. The relationship between the variables and the significant influence of socio-economic and demographic variables on early menopause was analysed using bivariate and multivariate analysis. The results showed that Indonesian women who experienced premature menopause were 12.35 percent. Early menopause tends to be shared more by Indonesian women in urban areas than in rural areas. Women with higher education, and women with the richest wealth quintile were more likely to experience premature menopause. Meanwhile, women who are housewives, and women who smoke are more likely to experience premature menopause. The problem of premature menopause should receive serious attention because it has negative health consequences.

INTRODUCTION

Menopause consists of three types, namely artificial menopause, early menopause, and natural menopause. Artificial menopause occurs for various reasons, including chemotherapy, radiation, hysterectomy, or the use of certain drugs. The hysterectomy referred to here is a total hysterectomy. Meanwhile, partial hysterectomy does not cause immediate menopause. Usually, a partial hysterectomy removes the uterus without the ovaries. Even though a woman is no longer menstruating, her ovaries still secrete eggs and produce oestrogen and progesterone. Total hysterectomy is to remove the uterus along with the ovaries. This condition causes immediate menopause without a transition phase (Halow et al. 2012).

Early menopause occurs when a woman is in her 30s or early 40s. Early menopause occurs earlier than normal menopause, which can be caused by nutritional deficiencies, immune system diseases, or chronic stress (Kalantaridou et al. 1998).

Most women experience natural menopause. Menopause occurs in stages, namely peri-menopause, menopause and post-menopause. Women who experience menopause are aged 45-55 years. They may not experience symptoms as severe as artificial menopause and early menopause.

There are differences in the age of menopause in each region. Asian women have faster menopause (42.1-49.5 years) than European (50.1-52.8 years), North American (50.5-51.4 years), and Latin American (43, 8-53 years) women (Palacios et al. 2010). The average menopause age for Indonesian women is 49.98 years (Yohanis 2013).

Postmenopausal women are at risk of developing cardiovascular diseases. This situation occurs due to a reduced amount of the hormone oestrogen, which affects cardiovascular function and metabolism of menopausal women (Newson 2018; Polmalar et al. 2013). The results of a study showed that women who experienced early menopause had a risk of 1.83 times more of osteoporosis at the age of 7, and 1.68 times the risk of fracture (Svejme et al. 2012). The age at which menopause is slower (late menopause) increases the risk of breast cancer, endometrial and ovarian cancer (Forman et al. 2013). Also, menopausal women experience hot flashes, sleep disturbances, night sweats, sexual dysfunction, weight gain,

mood disorders, cognitive decline (Sussman et al. 2015; Woods et al. 2005) and can cause increased inflammation of the periodontal tissue (Shu et al. 2008).

Many factors are associated with the age of menopause, including socio-demographic characteristics, reproductive factors, and lifestyle factors. Research in India states that women with less parity are more likely to experience menopause at an early age than women with more parity (Pathak and Parashar 2010). Research in Poland states that women with earlier menarche age will experience menopause 0.3 years earlier than women with longer menarche age (Kaczmarek 2007).

Furthermore, a cohort study in the Netherlands proved that the use of high doses of oral contraceptives for more than three years increased the risk of experiencing menopause by 1.12 times faster than women who did not use oral contraceptives (de Vries et al. 2001). Another factor associated with menopause is lifestyle factors.

Meschia et al.'s research stated that smokers have a faster menopausal age than non-smokers (Meschia et al. 2000). Hardy's study says that women who smoke have a 1.63 times risk of early menopause than former smokers (Hardy et al. 2000). Furthermore, Schoenaker et al. (2014) states a relationship between high physical activity and faster menopause. Other studies have shown that women with a low body mass index (18.5) or who are malnourished have a higher risk of premature menopause (Nagata et al. 2000; Sapre and Thakur 2014).

Objectives

The health of women after the reproductive period has received less attention in Indonesia. Government policies generally focus on women of childbearing age, maternal and child health. In contrast, early menopause can cause osteoporosis and cardiovascular disease associated with morbidity and mortality. Previous research in Indonesia has linked chiefly this situation to factors such as marital status and the age at which the last child was born (Ginting et al. 2019) period of menarche, parity, and contraception (Astikasari and Nasifah 2019; Kartini 2020) but more important things are to analyse all socio-demographic

factors. Thus, this study aims to examine the prevalence and examine the socio-economic, demographic, and lifestyle factors of Indonesian women who experience premature menopause.

MATERIAL AND METHODS

Data Source

Analysis of cross-sectional survey data from the Indonesian Demographic and Health Survey (IDHS) in Indonesia during 2017 is carried out in this study. The survey is conducted in all regions of Indonesia. The survey provides reliable maternal and child health, fertility, family planning, mortality, and other related indicators. The 2017 IDHS results from the collaboration between several government agencies, such as the Central Statistics Agency, the National Population and Family Planning Agency, and the Republic of Indonesia's Ministry of Health. Information comes from 47,963 households and 49,627 women aged 15 to 49 years (married and unmarried) and 17,848 children.

In the 2017 IDHS, the survey uses a stratified two-stage sampling pattern for rural and urban areas. They were first selecting several census blocks in a systematic probability proportional to the number of households in the 2010 Population Census. Then 25 ordinary families were selected in each census block, which were systematically selected from the results of updating the families in each census block. The sample of currently married men was eight households systematically selected from 25 homes. Data obtained through various interview forms, including household forms, eligible women's forms, male forms, and village forms. The response rate for households in the 2017 IDHS was 99.5 percent across all regions. The individual response rate for women was 97.8 percent, and for men it was 95.9 percent (Central Statistics Agency 2017).

Methodology

This study used bivariate and multivariate analysis to process data. A bivariate analysis is carried out to determine the pattern of the relationship between the variables in the research and early menopause. Meanwhile, to determine the significant effect of these variables on early

menopause, multivariate analysis and logistic regression were carried out.

Result Variable

Early menopause referred to in this study is derived from data on currently married women aged 30-40 years who did not menstruate for six months or more before the survey. Pregnant women and postpartum amenorrhea were not considered for this study. The second variable is woman aged more than 40 years experiencing premature menopause (less than 50 years).

Variable Explanation

Demographic and socio-economic variables that theoretically play a role in early menopause were considered in this study. These variables are age (30-32, 33-34, 35-36, 37-38, 39-40 years), household wealth (poorest, poorer, middle, rich, and richest), educational status, and children been born, the use of contraceptives, the respondent's occupation, the availability of media access, smoking behaviour, and residence (village/city) of living in both provinces and parts of Indonesia. Media exposure variables categorised into media exposure and not media exposure. Media exposure was measured by asking how often they read newspapers/magazines, listened to the radio, or watched television, and access to mass media, including the use of the Internet. Respondents who access the mass media at least once a week considered routinely accessing it. The smoking behaviour variable categorises as 'yes' or 'no'. Data on smoking behaviour were collected by asking respondents about their consumption of cigarettes and other types of tobacco.

Ethical Approval

The study has ethical approval from the applied country's Ethics Committee and ICF Macro. Research registration was carried out on the Demographic and Health Survey (DHS) website to obtain permission to use and analyse the data set.

RESULTS AND DISCUSSION

Table 1 shows the distribution and percentage of premature menopausal women among In-

donesian women whose ages made it into five groups with the lowest results with a value of 11.58 percent in the age range 30-32, for the second-lowest rank, namely the 33-34 years age group with a result of 12.08 percent, in the age group 35-36 years with a yield of 12.89 percent, 12.34 percent in the age group 37-38 years and the highest percentage with a value of 13.02 percent in the age range 39-40 years. Table 1 shows that increasing age increases the risk of premature menopause. Meanwhile, Table 2 shows the distribution of menopausal women throughout Indonesia, aged 30-49. The highest percentage was found at the age of 45-49, as much as 32.11 percent. Table 3 shows the distribution of premature menopausal women in all provinces of Indonesia. The highest percentages were in the regions of Bengkulu (21.28), South Sumatra (19.45), and Lampung (17.80).

Table 1: Distribution and percentage of premature menopausal women among Indonesian women aged 30-40 years

Age group	N	%
30-32	337	11.58
33-34	269	12.08
35-36	299	12.89
37-38	305	12.34
39-40	316	13.02
Total	1526	12.35

Source: Generated from Indonesia DHS, 2017

The results of the multivariate analysis of this study are presented in Table 4. Age did not have a significant effect on preterm menopause. Simultaneously, women with a college-level or higher education were 4.57 times more likely to experience premature menopause than those without education. Working women can reduce the risk of premature menopause by 0.93 times than those who do not work. Smoking behaviour can increase the risk of experiencing premature menopause by 1.5 times that of non-smokers. Women who have access to media have shown to increase their chances of premature menopause by 1.08. Women from the richest wealth quintile were 1.5 times more likely to experience premature menopause than those from the poorest wealth quintile. Women living in rural areas lowered their potential for premature menopause by 0.67 times. Women who

live in the eastern part of Indonesia are 1.46 times more likely to experience premature menopause.

The prevalence of early menopause in Indonesia from the results of the study is high, namely 12.35 percent (Table 1). This result is different from India's research, which only reached 5.5 percent for women aged 30-40 (Jungari and Bal Govind 2017). This situation is very likely to have serious health consequences for women in Indonesia. The bivariate test results (Table 2) show that compared to women in urban areas, women in rural areas are more likely to experience premature menopause. Similarly, Dasgupta and Ray (2009) state that premature menopause is more likely to occur in rural areas than in urban areas. The condition that supports this situation is that rural women are more limited in accessing health services and care than urban women.

Table 2: Distribution and percentage of menopausal women among Indonesian women aged 30-49 Years

Age group	N	%
30-34	607	11.8
35-39	760	12.56
40-44	890	14.16
45-49	1880	32.11
Total	4136	17.71

Source: Generated from Indonesia DHS, 2017

The research shows that women in the richest wealth quintile are more likely to develop premature menopause than women in the poorest wealth quintile. Likewise, highly educated women are more likely to experience premature menopause than uneducated women. Different things show in India's results (Jungari and Bal Govind 2017), and the richest wealth quintile and higher education are factors preventing premature menopause.

The results showed that women who smoked in any form were 1.47 more likely to experience premature menopause than those who did not smoke (Table 3). This study's results are similar to those in Oslo, Norway, which states that women who smoke have a 1.71 times higher risk of experiencing premature menopause than non-smoking women. Women who smoke more than ten cigarettes per day have a 1.54 times risk of experiencing premature menopause than women who do not smoke (Mikkelsen et al. 2007). In Po-

land, previous research conducted by Kaczmarek stated that both, women who actively smoke and women who have smoked have a significant relationship with premature menopause (Kaczmarek 2007). The results of a similar study, namely the study of Gold et al. (2013) stated that women who do not smoke are associated with a lower incidence of menopause (Gold et al. 2013).

Table 3: Incidence of preterm menopause among Indonesian women aged 30-40 by province

Province	N	%
Aceh	51	8.12
Sumatera Utara	38	6.03
Sumatera Barat	28	9.22
Riau	44	13.20
Jambi	24	11.87
Sumatera Selatan	67	19.45
Bengkulu	48	21.28
Lampung	63	17.80
Bangka Belitung	17	7.77
Pulau Riau	20	5.96
Jakarta	26	5.37
Jawa Barat	158	11.40
Jawa Tengah	149	15.59
Yogyakarta	8	5.83
Jawa Timur	135	13.05
Banten	72	16.47
Bali	34	16.38
Nusa Tenggara Barat	41	12.35
Nusa Tenggara Timur	35	6.62
Kalimantan Barat	34	13.06
Kalimantan Tengah	30	16.29
Kalimantan Selatan	22	10.03
Kalimantan Timur	31	10.23
Kalimantan Utara	15	7.73
Sulawesi Utara	24	17.43
Sulawesi Tengah	50	14.10
Sulawesi Selatan	58	12.51
Sulawesi Tenggara	39	9.24
Gorontalo	22	12.63
Sulawesi Barat	35	8.06
Maluku	32	7.70
Maluku Utara	46	17.18
Papua Barat	14	9.09
Papua	16	7.68
Total	1526	12.35

Source: Generated from Indonesia DHS, 2017

Smoking is a lifestyle factor that has various negative impacts on health. One of them is the impact on fertility and has been identified by several studies to be a factor in the cause of premature ovarian failure (POF). Smoking can directly affect ovarian follicles, which shows a significant effect on serum inhibin B concentrations. Serum

inhibin B is produced from granulosa cells in ovarian follicles, which help in regulating FSH release. Therefore, a decrease in inhibin B tends to reflect a reduction in hairs. Waylen et al.'s research stated that the serum inhibin B levels in women who smoked were more minor than former smokers and non-smokers, which caused ovarian aging to be faster (Waylen et al. 2010). Also, Schoenaker et al. (2014) in their research, explained that smoking is associated with hormone production and metabolism, including CYP1A2 gene expression and reduced serum oestrogen levels, increased 2-hydroxy oestrogen concentration, and increased quantity of androgens. All of these can affect the anti-oestrogen effect, which can cause menopause to be faster (Schoenaker et al. 2014). The anti-oestrogen product in cigarettes can cause premature menopause because oocytes degrade in the presence of polycyclic aromatic hydrocarbons in cigarettes (Meschia et al. 2000). Based on this exposure, it can be concluded that smoking can have a health impact in the form of a shorter menopausal age than with women who have smoked and never smoked. Therefore, health workers should increase health promotion regarding smoking bans, especially for women, with the impact of smoking on their reproductive health.

The results show that women who work are 0.92 times less likely to develop premature menopause than women who do not work (Table 3). Working women are more likely to have high physical activity. Research by Dorjgochoo et al. in Shanghai stated that both adolescents and adult women who have increased physical activity are associated with slower menopause and a longer reproductive span (Dorjgochoo et al. 2008). The results of a cohort study conducted by Dratva et al. (2009) in European women stated that women who have low physical activity have a 1.35 times greater risk of experiencing premature menopause than women who have moderate physical activity (Dratva et al. 2009).

In Table 4, it can be seen urban women are more likely to experience premature menopause because in other research in Iran, urban women were significantly different from rural women in terms of menopausal symptoms, concerns and attitudes. Hot flushes, a common menopausal symptom, and decreased sexual desire were more common in the urban women. On the other hand, the rural women experienced more concern about menopause and its consequences (Hakimi et al. 2018).

Table 4: Predictions of women with premature menopause in Indonesia on 2017

Variables	OR	95% CI	
		Lower	Upper
Woman Characteristic			
Grouping Age			
30-32	1.00		
33-34	0.99	0.81	1.22
35-36	0.95	0.77	1.16
37-38	1.02	0.83	1.26
39-40	0.99	0.81	1.22
Education Level			
No education	1.00		
Primary	0.98	0.53	1.79
Secondary	1.56	0.84	2.89
Higher	4.57	2.32	8.99
Women Occupation			
Housewives	1.00		
Working	0.93	0.81	1.06
Smoking			
No	1.50	0.96	2.35
Yes	1.00		
Media Exposure			
No exposure	1.08	0.65	1.79
Exposure	1.00		
Household Characteristic			
Wealth Quintile			
Poorest	1.00		
Poorer	0.84	0.69	1.02
Middle	0.92	0.75	1.13
Richer	0.88	0.71	1.11
Richest	1.50	1.12	2.02
Place of Residence			
Rural	0.67	0.57	0.78
Urban	1.00		
Indonesian Regional Division			
Western Indonesia	1.00		
Central Indonesia	1.12	0.96	1.31
Eastern Indonesia	1.46	1.04	2.06

Source: Generated from Indonesia DHS, 2017

CONCLUSION

Early menopause among women in Indonesia has a high percentage, especially in Bengkulu, South Sumatra, and Lampung. Indonesian women in rural areas are less likely to experience premature menopause than those in urban areas. Women with the richest wealth quintile and women with higher education are more likely to experi-

ence premature menopause. Meanwhile, women who smoke and women who do not work (housewives) are more likely to experience premature menopause.

RECOMMENDATIONS

Early menopause and the factors that play a role in it need serious attention from the Indonesian government, especially the health office, which deals with women in urban areas. Early menopause has a negative impact on health because it triggers osteoporosis and cardiovascular disease.

LIMITATIONS OF THE STUDY

This study has limitations because there is no data on the medical causes of early menopause. It cannot be distinguished between natural premature menopause and premature medical menopause.

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