RESEARCH ARTICLE

Determinants Affecting Menopause At Kamboja Posyandu, Tambakmas Village, Indonesia

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ABSTRACT **Background:** Menopause generally occurs between the ages of 45 and 55, but various factors can influence its timing, including the possibility of early or premature menopause. This phase significantly affects a woman's quality of life, from physical and emotional changes to an increased risk of degenerative diseases such as osteoporosis and cardiovascular disorders. Given its health implications, it is important to understand the determinants that contribute to the onset of menopause. This study aims to analyze the factors influencing menopause among women aged 40–60 years at the Kamboja Posyandu, Tambakmas Village. **Methods:** This quantitative study employed an analytic survey approach with a cross-sectional design. The population consisted of 200 women aged 40–60 years, with a sample of 134 respondents selected using proportional simple random sampling. The independent variables were age, genetic history, lifestyle, general health, medical interventions, and environmental exposure. The dependent variable was menopause status, classified into premenopause, perimenopause, and menopause. Data were collected using structured interviews and analyzed using multinomial logistic regression at a 95% confidence level ($\alpha = 0.05$). **Results:** The analysis showed that five of the six variables—age, genetic factors, lifestyle, medical interventions, and environment—were significantly associated with menopause status ($p < 0.05$). General health, however, did not show a statistically significant relationship ($p = 0.840$). **Conclusion:** The study concludes that menopause among women aged 40–60 in Tambakmas Village is influenced by a combination of biological, behavioral, and environmental factors. These findings underscore the importance of community-based interventions and targeted health education on menopause. The results may be used by healthcare providers and policymakers to strengthen midwives' roles in supporting women during the menopausal transition, promoting a healthier and more informed aging process.

KEYWORDS menopause, determinants.

I. BACKGROUND

Menopause is a natural phase in a woman's life that marks the end of the menstrual cycle and reproductive period. This condition generally occurs between the ages of 45 and 55 due to the decline in ovarian function and estrogen hormone levels [1]. Although it is a physiological process, the age of menopause can vary among individuals and is influenced by various internal and external factors [2]. Globally, the average age of menopause is 51 years in South America, 48–49 years in Africa, and approximately 49–50 years in Asia, including Indonesia [3]. According to data from the Indonesian Ministry of Health (2024), the number of menopausal women in Indonesia is projected to reach 60 million by 2025. This figure reflects an increasing trend, including in East Java Province and Magetan Regency.

Menopause is often accompanied by physical and psychological symptoms that can affect women's quality of life, such as hot flushes, fatigue, insomnia, palpitations, joint pain, mood disturbances, and anxiety [4]. These symptoms may become more severe in women with certain risk factors. Several known determinants influencing the onset of menopause include age, genetic history, lifestyle (such as smoking and alcohol consumption), general health status, history of medical interventions (e.g., ovarian surgery), and environmental exposure to endocrine-disrupting chemicals [5], [6].

Based on this background, the study aims to analyze the determinants that influence menopause among women aged 40–60 years at Posyandu Kamboja, Tambakmas Village. The population was chosen because it consists of a relatively large number of women in that age range—200 individuals—who actively participate in posyandu activities. Additionally, the area faces limited access to reproductive health information, including issues related to menopause. The results of this study are expected to serve as a basis for designing more targeted community-based interventions and strengthening the role of midwives in menopause care services.

The government has responded to this challenge by establishing elderly care posts (Posyandu Lansia), which serve as basic health service centers, including education on menopause. Midwives play a vital role in providing comprehensive care to women during the perimenopausal period through promotive, preventive, curative, and

rehabilitative approaches [7], [8]. Research by [9] even shows that empowering menopause support groups can improve elderly women's knowledge and attitudes toward reproductive health maintenance.The government has responded to this challenge by establishing elderly care posts (Posyandu Lansia), which serve as basic health service centers, including education on menopause. Midwives play a vital role in providing comprehensive care to women during the perimenopausal period through promotive, preventive, curative, and rehabilitative approaches [7], [8]. Research by [9] even shows that empowering menopause support groups can improve elderly women's knowledge and attitudes toward reproductive health maintenance.

II. METHODS

This study is an analytic survey using a cross-sectional design. The research was conducted in February 2025 at the Kamboja *Posyandu*, located in Tambakmas Village, Sukomoro Subdistrict, Magetan Regency. The population of this study consisted of all women aged 40–60 years residing in Tambakmas Village, totaling 200 individuals. A sample of 134 respondents was selected using proportional simple random sampling.

The independent variables included age, genetics/heredity, lifestyle, general health, medical interventions, and environmental factors. The dependent variable was menopause status (pre-menopause, perimenopause, menopause, postmenopause).

Data processing was carried out through the processes of editing, coding, and tabulating. Data analysis was conducted using univariate, bivariate (Chi-square test), and multivariate methods with multinomial logistic regression to determine the effect of each factor on menopause status, with a 95% confidence level ($\alpha = 0.05$). The test was used to identify the influence of each variable on the occurrence of menopause. Ethical considerations included informed consent, assurance of data confidentiality, and approval from the relevant ethics committee.

This study received ethical approval from the Health Research Ethics Committee (KEPK) of Poltekkes Kemenkes Surabaya with approval number: EA/3135/KEPK-Poltekkes_Sby/V/2024. All participants were provided with an informed consent form prior to data collection.

III. RESULTS

The study titled Determinants Influencing Menopause at the Kamboja Posyandu, Tambakmas Village was conducted on February 17, 2025, from 08:00 to 12:00 WIB, with the following results:

A. General Overview of the Research Location

The study was conducted at the Kamboja Posyandu, located in Tambakmas Village, Sukomoro Subdistrict, Magetan Regency, East Java Province. Tambakmas Village covers an area of approximately 2.50 km² and is known as one of the villages with active agricultural activities in Sukomoro Subdistrict [10]. According to 2016 data, the population of Tambakmas Village reached 2,067 people, with the majority engaged in agriculture and plantation sectors, especially as pomelo orange farmers. The village is recognized as one of the main centers of pomelo orange production in Magetan Regency [10], [11]. In addition, some residents make a living from small-scale trade, home industries, and service sectors.

B. Frequency Distribution of Determinants: Age, Genetics, Lifestyle, Health, Medical Interventions, and Menopause

Tabel 1
Frequency Distribution

Independent variables	Criteria	Menopause				Total
		Pra menopause	Peri menopause	Menopause	Pasca Menopause	
Age	<40	7	0	0	0	7
		100.0%	0.0%	0.0%	0.0%	100.0%
	40-55	17	12	19	73	121
		14.0%	9.9%	15.7%	60.4%	100.0%
	>55	0	0	0	6	6
		0.0%	0.0%	0.0%	100.0%	100.0%
Total		24	12	19	79	134
		17.8%	9.0%	14.2%	59.0%	100.0%
Genetic	No genetic history	21	11	13	37	82
		25.6%	13.4%	15.9%	45.1%	100.0%
	Genetic history	3	1	6	42	52
		5.8%	1.9%	11.5%	80.8%	100.0%
Total		24	12	19	79	134
		17.8%	9.0%	14.2%	59.0%	100.0%
Life style	health	3	5	3	37	48
		6.3%	10.4%	6.3%	77.0%	100.0%
	unhealth	21	7	16	42	86
		24.4%	8.2%	18.6%	48.8%	100.0%
Total		24	12	19	79	134
General health	Health	16	10	15	57	98
		16.3%	10.2%	15.3%	58.2%	100.0%
	Unhealth	8	2	4	22	36
		22.2%	5.6%	11.1%	61.1%	100.0%
Total		24	12	19	79	134
		17.8%	9.0%	14.2%	59.0%	100.0%
Medic intervention	never	21	8	18	49	96
		21.9%	8.3%	18.8%	51.0%	100.0%
	ever	3	4	1	30	38
		7.9%	10.6%	2.6%	78.9%	100.0%
Total		24	12	19	79	134
		17.8%	9.0%	14.2%	59.0%	100.0%
environment	Not exposed	4	1	7	8	20
		20.0%	5.0%	35.0%	40.0%	100.0%
	exposed	20	11	12	71	114
		17.5%	9.7%	10.5%	62.3%	100.0%
Total		24	12	19	79	134
		17.8%	9.0%	14.2%	59.0%	100.0%

Based on the table above, the most influential age variable was in the 40–55 age range, with 73 individuals (60.4%) in postmenopausal status. For the genetic variable, those with a hereditary background were the most affected, with 42 individuals (80.8%) in postmenopausal status. Regarding the lifestyle variable, an unhealthy lifestyle was the most influential, with 42 individuals (48.8%) in postmenopausal status. In terms of health, those with a healthy status were the most affected, with 57 individuals (58.2%) in postmenopausal status. For the medical intervention variable, the most

influential group was those who had never undergone medical intervention, with 49 individuals (51%) in menopausal status. Finally, for the environmental variable, those living in exposed environments were the most affected, with 71 individuals (62.3%) in postmenopausal status.

C. Analisa

Tabel 2
Parameter estimate

Menopause		B	Wald	Sig.
Peri menopause	Intercept	.558	.115	.734
	Genetics	-.493	.156	.693
	Lifestyle	-2.289	3.625	.057
	Health	-.497	.260	.610
	Medical Intervention	.708	.548	.459
	Environment	1.251	1.017	.313
	[Age=1]	-21.683	.	.
	[Age=2]	-.121	.	.
	[Age=3]	0ᵇ	.	.
Menapouse	Intercept	1.707	1.591	.207
	Genetics	.737	.791	.374
	Lifestyle	-1.230	1.005	.316
	Health	-.618	.591	.442
	Medical Intervention	-1.490	1.438	.230
	Environment	-.841	1.143	.285
	[Age=1]	-20.689	.	.
	[Age=2]	.236	.	.
	[Age=3]	0ᵇ	.	.
Pasca menapouse	Intercept	19.817	.000	.992
	Genetics	2.400	10.381	.001
	Lifestyle	-2.938	7.203	.007
	Health	.139	.041	.840
	Medical Intervention	1.305	2.604	.107
	Environment	1.157	1.976	.160
	[Age=1]	-39.017	.000	.995
	[Age=2]	-18.330	.000	.993
	[Age=3]	0ᵇ	.	.

In the table, a positive B value indicates that the variable increases the likelihood, while a negative B value indicates that the variable decreases the likelihood. Significance (Sig./p-value) less than 0.05 means the variable has a significant effect. The larger the Wald value, the stronger the statistical influence. Looking at the postmenopausal category, the genetic variable has the highest value with B = 2.400, indicating the greatest influence; the Wald value of 10.381 means it has the strongest effect, and the significance value of 0.001 (< 0.05) indicates it is the most statistically significant.

Tabel 3
Likelihood Ratio Tests

Model	-2 Log Likelihood	Chi-Square	df	Sig.	Decision H₀
Intercept	90.391ᵃ	.000	0	.	
Genetics	113.960	23.569	3	.000	Rejected
Lifestyle	105.828	15.437	3	.001	Rejected
Health	91.991	1.600	3	.659	Diterima
Medical Intervention	100.909	10.518	3	.015	Ditolak
Environment	98.910	8.519	3	.036	Ditolak
Age	124.560	34.169	6	.000	Ditolak

In the table, the Sig. values for Age, Genetics, Lifestyle, Medical Intervention, and Environment are less than α (0.00, 0.000, 0.001, 0.015, 0.036 < 0.05), indicating that these variables have a significant effect on the dependent variable (menopause). Meanwhile, the Health variable has a Sig. value greater than α (0.659 > 0.05), which means it does not have a significant effect on the dependent variable (menopause).

Tabel 4
Goodness of Fit

	Chi-Square	df	Sig.
Pearson	91.239	87	.357
Deviance	48.647	87	1.000

Based on the table above, it is known that the significance values for both Pearson and Deviance are greater than α = 0.05, which means that H0 is accepted and the model is considered appropriate.

Tabel 5
Pseudo R²

Pseudo R-Square	
Cox and Snell	.494
Nagelkerke	.554
McFadden	.306

The Nagelkerke value is 0.554, which means that the dependent variable (menopause) can be explained by the independent variables by 55.4%, while the remaining 44.6% is explained by other factors not examined in this study.

IV. DISCUSSION

The following is a discussion of the research findings from 134 female respondents who participated in the activities of Posyandu Kamboja regarding the influence of determinants on menopause, starting from the most significant.

A. Influence of Age on Menopausal Incidence

The results showed that age had the most significant influence on the occurrence of menopause, indicated by a p-value of 0.000, which is smaller than α (0.05). Theoretically, age is the main biological factor in the menopausal process. Menopause generally occurs between the ages of 45 and 55, in line with declining ovarian function, which leads to reduced estrogen production [12]. This hormone reduction causes the menstrual cycle to cease and the emergence of various menopausal symptoms.

Previous research by [13] stated that women who experience menopause at a normal age (45–55 years) tend to be more prepared for physiological and psychological changes. [14] also noted that women who go through menopause outside the normal age range experience more severe psychosomatic complaints than those who do so within the normal age range.

The majority of respondents (90.3%) were in the normal menopausal age range, which, according to the researcher, indicates that the menopausal transition in the study area occurs naturally. However, education remains necessary to

increase women's readiness and knowledge in facing this transition.

B. Influence of Genetics on Menopausal Incidence

The analysis showed that genetic factors significantly affected menopause, with a p-value of 0.001. Women with a family history of menopause (mother or siblings) are more likely to experience menopause at a similar age. Theoretically, natural menopausal age is also determined by genetic components. The heritability of menopause illustrates that hereditary factors play a key role in determining menopausal timing (van Asselt, 2004) [15].

Previous research by van Asselt (2004) [15] stated that the heritability of menopausal age between mothers and daughters reaches 44%. This finding is supported by this study, where 38.8% of respondents had a genetic history of menopause. Although genetic factors are non-modifiable, they should be recognized early as part of promotive and preventive strategies. Family history information can serve as the basis for reproductive health counseling for women of reproductive age approaching menopause.

C. Influence of Lifestyle on Menopausal Incidence

Lifestyle was found to have a significant influence, with a p-value of 0.007. Respondents with unhealthy lifestyles (64.2%) experienced menopause more frequently than those with healthy lifestyles. Theoretically, habits such as smoking, alcohol consumption, unhealthy diets, and lack of physical activity affect hormonal balance and accelerate menopause (Weyhrich, 2024) [15]. A healthy lifestyle also helps alleviate menopausal symptoms such as hot flashes, insomnia, and depression. Research by Kristel van Asselt (2004) [15] noted that smoking significantly increases the risk of early menopause. This is in line with this study, which showed a strong correlation between unhealthy lifestyles and accelerated menopause. Intensive education is needed for women of reproductive age about the importance of a healthy lifestyle, not only to prevent degenerative diseases but also to delay the onset of menopause and improve quality of life after menopause.

D. Influence of Medical Intervention on Menopausal Incidence

The study showed a significant influence of medical intervention on menopause, with a p-value of 0.015. According to WHO (2024) [16], menopause can occur due to medical interventions such as hysterectomy, oophorectomy, or radiation therapy, which abruptly halt estrogen production. This type of menopause is known as induced menopause. Research by [17] also proved that women who undergo medical interventions are at higher risk of early menopause, especially when the procedures involve the ovaries or endocrine reproductive tissues. Although medical intervention cases were not dominant in this population, it is important for healthcare providers, especially midwives, to provide counseling before and after reproductive system-related medical procedures. Understanding the impact can reduce anxiety and better prepare women for menopausal symptoms.

E. Influence of Environment on Menopausal Incidence

The environment showed a significant influence on menopause, with a p-value of 0.036. Most respondents (85.1%) lived in areas exposed to potential pollutants, such as livestock pens near water sources or household waste. According to [15], endocrine-disrupting chemicals like phthalates, bisphenol A, and heavy metals can disturb hormonal balance and accelerate menopause. Chronic exposure to these substances can harm ovarian reserves. Experimental studies by [15] supported this, showing long-term chemical exposure is associated with early menopause, vasomotor symptoms, and hormonal imbalances. In the context of a healthy home, the distance between livestock pens and clean water sources (such as wells or water pumps) is crucial to prevent contamination from animal waste. Animal feces contain pathogens like Escherichia coli, Salmonella, and other parasites that can pollute water and endanger human health.

According to the Indonesian Ministry of Health (2002) [18] in the Housing Sanitation Guidelines, the minimum distance between livestock pens and water sources should be 10 meters to prevent groundwater contamination. This is based on the principle that organic waste from animals can seep into soil and pollute groundwater, especially in porous soil or when there is no impermeable layer. Furthermore, Ministry of Health Regulation No. 829/MENKES/SK/VII/1999 on Environmental Health Requirements for Housing states that residential environments should be free from pollution, including from livestock pens located too close to clean water sources.

The environment is an external determinant that is often overlooked in reproductive health approaches. Reproductive health education at the Posyandu and village level should begin including household environmental management topics, such as sanitation and livestock placement. These small steps can significantly help maintain women's hormonal balance and prevent early menopause caused by hazardous chemical exposure.

F. Influence of Health on Menopausal Incidence

The analysis showed that general health status did not significantly influence menopausal incidence, with a p-value of 0.840 (>0.05). This result indicates that the overall health condition of the respondents, including chronic disease history and physical condition, did not directly affect the timing or phase of menopause in women aged 40–60 at Posyandu Kamboja, Tambakmas Village.

This finding differs from some previous studies, such as [19], which showed that women with chronic health issues, especially hypertension or diabetes, are more likely to experience early menopause. Additionally, [20] mentioned that diseases like hypertension and metabolic disorders could accelerate ovarian degeneration and potentially trigger early menopause. Similarly, [12] stated that declining estrogen levels affect organ and central nervous system health, which also influences hormonal balance and menopausal timing. However, this study's results are still aligned with [6], which stated that health factors do not directly affect menopause and

often overlap with other variables such as genetics and lifestyle.

General health, including chronic illness history, nutritional status, and physical fitness, plays an important role in determining menopausal age. Women with chronic diseases like diabetes, hypertension, or autoimmune disorders are more likely to experience early menopause due to hormonal imbalances or ovarian damage caused by inflammation [21]. Poor nutritional status or malnutrition can also affect estrogen and progesterone production, accelerating the menopausal process [22]. Reproductive health factors such as infection history, menstrual disorders, or medical procedures like uterine or ovarian removal also contribute to early menopause [23]. Moreover, unhealthy lifestyles that impact health, such as lack of physical activity and imbalanced diets, further accelerate ovarian function decline [24].

According to the researcher, the insignificance of the health variable may be due to the homogeneous conditions of the respondents, as most of them were in relatively good or stable health, did not suffer from serious chronic diseases, and had access to basic health services through Posyandu. In addition, the health assessment approach in the questionnaire might have caused information bias or perception bias, as respondents may have provided socially desirable responses rather than actual conditions.

V. CONCLUSION AND RECOMMENDATIONS
A. CONCLUSION
Based on the results of a multinomial logistic regression analysis of 134 female respondents aged 40–60 years at Posyandu Kamboja, Tambakmas Village, the following conclusions can be drawn:

1. The characteristics of the respondents showed that the majority were over 55 years old. Most had only completed elementary school (SD), were housewives, had more than one child (multiparous), primarily used hormonal contraceptives, and experienced their last menstruation between the ages of 40–55 years (normal menopausal age).
2. Age was found to influence the occurrence of menopause.
3. Genetic factors were found to influence menopause.
4. Lifestyle factors were found to influence menopause.
5. Health status was found to influence menopause.
6. Medical interventions were found to influence menopause.
7. Environmental factors were found to influence menopause.
8. Among the six determinants studied, five were found to significantly influence menopause: age, genetics, lifestyle, medical intervention, and environment. Health factors did not show a significant influence on menopause in this study

B. RECOMMENDATION
Based on the conclusions above, the following recommendations are proposed:
1. **For Respondents (Women of Menopausal Age)** It is expected that respondents will be more active in

educational activities at the Posyandu. They are also encouraged to adopt a healthy lifestyle and maintain a clean and comfortable environment free from pollutants. Regular health check-ups are also recommended.

2. **For Health Service Institutions** Health workers are encouraged to be more proactive in providing education about menopause at Posyandu. Distributing pocketbooks may enhance the effectiveness of education in the community. Collaboration with environmental health officers (sanitation) and local government is recommended to provide appropriate environmental health education.

3. **For Educational Institutions** Educational institutions are encouraged to motivate students to take up menopause as a topic for their thesis or final projects, especially related to its determinants, quality of life, or educational interventions.

4. **For Other Researchers** It is hoped that the findings of this study can serve as a reference for future research. Other researchers are also encouraged to explore additional determinants of menopause not addressed in this study.

5. **For the Researcher** The researcher hopes to continue this study or conduct new research in the future to further develop skills in writing scientific papers.

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