

## The Duration of Combined Oral Contraceptive Use on The Incidence of Melasme

Faza Nabila

Bachelor of Midwifery, Faculty of Health, Universitas Muhammadiyah Gresik

[fazanabila@umg.ac.id](mailto:fazanabila@umg.ac.id)

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### Abstract

**Introduction:** Melasma is a common problem experienced by women. The cause of melasma is not only age but also the use of contraceptives. Melasma is a frequent complaint among birth control users because it significantly affects their appearance and aesthetics. **Objective:** The purpose of this study was to determine whether the duration of combined oral contraceptive use affects the incidence of melasma. **Method:** This study used a cross-sectional approach. The sample size of 55 users. The study was conducted from May to July 2025 in the Gending Community Health Center area, Gresik. Data collection used a questionnaire directed to respondents. Data analysis used the chi-square test. **Result and discussion:** The results of the study showed that there was an effect of the length of use of combined oral contraceptives on the incidence of melasma with a significance value of 0.003. **Conclusion:** The duration of combined oral contraceptive use can affect the incidence of melasma in women of childbearing age and those who have used it for more than 2 years.

**Introduction**

The world's population continues to grow rapidly. By the end of 2024, the global population is expected to reach 8.09 billion. This growth is dominated by developing countries. Indonesia is one of them, with a population growth rate of 282.48 million. One program to reduce population growth is through family planning programs (KB) (Liwang et al., 2018).

Contraception is an important component of the Family Planning (KB) program to regulate the spacing of pregnancies, delay, or prevent unwanted pregnancies. According to data from the National Population and Family Planning Agency (BKKBN) in 2020, the prevalence of family planning users in Indonesia was 66.2%. Of these, 17% used the contraceptive pill. According to the 2020 Basic Health Research, the use of contraceptive pills was 12.8%. Meanwhile, the results of the 2017 Indonesian Demographic Health Survey (SDKI) showed that contraceptive pill users were 14%(BKKBN, 2019). According to the World Health Organization (WHO), in 2019, nearly 380 million couples were implementing family planning programs (KB), and 65-75 million of them in developing countries used hormonal contraception, namely birth control pills. According to data from the BKKBN for East Java Province in April 2024, the number of active family planning acceptors was 5,287,343 participants.

The use of contraception is very diverse. One hormonal contraceptive method widely used by women is the combined oral contraceptive, a pill containing synthetic estrogen and progesterone hormones(Sembodo et al., 2020). This method is preferred because of its high effectiveness, ease of use, and the ability to return to normal after discontinuation. However, despite its effectiveness, hormonal contraceptive use often causes side effects. One common side effect among users of combined oral contraceptives is melasma, a skin hyperpigmentation condition characterized by brownish patches that typically appear on the face, especially the cheeks, forehead, and upper lip(Yanti & Lamaindi, 2021). Melasma is often referred to as the mask of pregnancy because its appearance resembles the hyperpigmentation that occurs in pregnant women due to increased estrogen and progesterone levels.

Several previous studies have shown a link between combined oral contraceptive use and the incidence of melasma. According to research conducted by(Perkasa, 2016), approximately 25–30% of combined oral contraceptive users experience melasma, especially those who use it for more than a year. Other factors such as sun exposure, genetics, and age also contribute to the condition.

In Indonesia, oral contraceptive use remains one of the most popular methods among women of childbearing age due to its convenience and high effectiveness(RI, 2018). However, few studies have specifically examined the effect of duration of combined oral contraceptive use on the incidence of melasma at the local level. This is important to understand so that healthcare professionals, particularly midwives and family planning officers, can provide appropriate education and monitoring to contraceptive users regarding the risks of possible long-term side effects(Saifuddin, 2018).

Based on the problem description above, the researcher is interested in conducting further research on the relationship between duration of combined oral contraceptive use and the incidence of melasma. The purpose of this study is to determine the extent to which duration of combined oral contraceptive use can influence the occurrence of melasma in women of childbearing age.

**Methods**

This research used a correlational study with a cross-sectional approach, aiming to determine the relationship between independent and dependent variables. The population used in this study was all combined birth control pill users, with a sample size of 55 users. The study was conducted from May to July 2025 in the Gending Community Health Center (Puskesmas) area, Gresik. Data collection used a questionnaire directed to respondents. Data analysis used the chi-square test with a significance level of 0.05 using SPSS 16 for Windows to determine whether there was a relationship. If  $p < 0.05$ , the null hypothesis ( $H_0$ ) is rejected, indicating that the duration of combined birth control pill use affects the incidence of melasma.

**Result and Discussion****1. Result****General Data**

**Table 1**  
Frequency distribution of respondent characteristics by Age

Age	Frequency	Percentage (%)
<20 year	2	3.6
20-35 year	43	78.2
>35 year	10	18
<b>Total</b>	<b>55</b>	<b>100</b>

Source: Primary Data 2025

Based on table 1, it shows that almost all respondents, namely 43 respondents (78.2%) were aged 20-35 years.

**Table 2**  
Frequency Distribution of Respondent Characteristics by Educational Level

Education	Frequency	Percentage (%)
Elementary/Junior High School	22	40
Senior High School	28	51
College/University	5	9
<b>Total</b>	<b>55</b>	<b>100</b>

Source: Primary Data 2025

Based on Table 2, most respondents had completed their last level of education at the senior high school level, totaling 28 respondents (51%).

**Table 3**  
Frequency Distribution of Respondent Characteristics by Occupation

Occupation	Frequency	Percentage (%)
Employed	19	34.6
Unemployed	36	65.4
<b>Total</b>	<b>55</b>	<b>100</b>

Source: Primary Data 2025

Based on Table 3, it can be observed that nearly all respondents were unemployed, totaling 36 respondents (65.4%).

**Table 4**  
Frequency Distribution of Respondent Characteristics by Parity

Parity	Frequency	Percentage (%)
2	17	30.9
>2	38	69.1
Total	55	100

Source: Primary Data 2025

Based on Table 4, nearly all respondents had a parity of more than two, totaling 38 respondents (69.1%).

### Specific Data

**Table 5**  
Frequency Distribution of Respondent Characteristics Based on the Duration of Combined Oral Contraceptive Use

Duration of Use	Frequency	Percentage (%)
< 2 years	12	21.8
>2 years	43	78.2
<b>Total</b>	<b>55</b>	<b>100</b>

Source: Primary Data 2025

Based on Table 5, it can be observed that most respondents had used combined oral contraceptives for more than 2 years, totaling 43 respondents (78.2%).

**Table 6**  
Frequency Distribution of Melasma Incidence Among Combined Oral Contraceptive Users

Melasma Incidence	Frequency	Percentage (%)
Yes	21	38.2
No	34	61.8
<b>Total</b>	<b>55</b>	<b>100</b>

Source: Primary Data 2025

Based on Table 6, most respondents did not experience melasma, totaling 34 respondents (61.8%).

**Table 7**  
Cross-Tabulation of Duration of Combined Oral Contraceptive Use and Melasma Incidence

		Melasma Incidence		Total	P Value
		Yes	No		
<b>Duration of Use</b>	< 2 years	2	10	12	0.003
	>2 years	19	24	43	
<b>Total</b>		<b>21</b>	<b>34</b>		

Source: Primary Data 2025

Based on the statistical analysis using the chi-square test, the results showed a p-value of 0.003, indicating that the duration of combined oral contraceptive use has a significant effect on the incidence of melasma.

## **2. Discussion**

### **Duration of Use of Combined Oral Contraceptives**

Based on the research results, it was found that almost all respondents (43 respondents) had used oral contraceptives for more than two years. The pill was the most popular contraceptive method among family planning users. Data from the East Java Provincial Health Office also showed that most active family planning participants were pill users, at 49.95%.

In terms of duration of use, most users had used the pill for more than two years. Although they were aware that the pill must be taken daily and can cause various side effects such as menstrual cycle disorders, weight gain, changes in sexual desire, anxiety, and melasma, most respondents still felt comfortable using it. This was because the pill was considered more practical and affordable (Haslan, H., & Indryani, 2020).

### **Incidence of Melasma**

The research results showed that most respondents (34 respondents) did not experience melasma. Respondents who did not experience melasma were generally injectable contraceptive users who had used it for less than two years. Meanwhile, 21 other respondents experienced melasma, which is likely caused by age and hormonal influences.

Melasma occurs due to increased melanin production by melanocyte cells, which protect the skin from ultraviolet (UV) rays (Nguyen, 2021). When skin is repeatedly exposed to sunlight, melanocyte cells continue to produce excess melanin, resulting in a buildup of pigment that appears as dark patches on the face. If left untreated, these hyperpigmented areas can spread (Melani, F., & Barokah, 2020). In addition to causing melasma, continuous sun exposure can also accelerate the skin aging process. Other factors such as sun exposure, genetics, and age also exacerbate the condition.

The estrogen hormone in combined oral contraceptives can increase the activity of melanocytes, the cells responsible for melanin production (Muslimah et al., 2023). This increased melanocyte activity causes the accumulation of melanin pigment in certain layers of the skin, ultimately resulting in hyperpigmented patches. Furthermore, the duration of combined oral contraceptive use is also thought to influence the severity of melasma, as the longer a person is exposed to these synthetic hormones, the greater the likelihood of skin pigmentation changes (Ariani & Sariati, 2018).

Preventing melasma can be done by limiting direct sun exposure and maintaining a good nutritional intake to maintain healthy skin (Asditya, A. and Sukanto, 2017). The effects of hyperpigmentation often affect women's self-confidence due to the appearance of dark spots on the face. Many women then try to remove these spots using whitening cosmetics, but often the results actually worsen the skin condition and cause the skin to darken (Hatijar, H., & Saleh, 2020).

### **Duration of Combined Oral Contraceptive Use and the Incidence of Melasma**

The results of the study showed a correlation between duration of combined oral contraceptive use and the incidence of melasma, with a  $p$  value of 0.003. Duration of use of combined oral contraceptives can increase the incidence of melasma in women of reproductive age, namely 20-35 years old. Most respondents who experienced melasma were combined oral contraceptive users with a duration of use of more than two years. This indicates that the longer the duration of contraceptive pill use, the greater the risk of melasma.

Physiologically, contraceptive pills work by suppressing ovulation by regulating levels of the synthetic hormone estrogen and progesterone (Kesehatan, 2019). Long-term increases in these hormone levels can stimulate the activity of melanocyte cells in the skin. Overactive melanocytes produce excess melanin, resulting in brown or blackish hyperpigmented patches on the face, known as melasma (Suryaningsih, 2019).

This finding aligns with dermatological theory, which states that estrogen and progesterone can strengthen the skin's response to ultraviolet light, resulting in faster and more intense pigmentation in long-term hormonal contraceptive users (Perkasa, 2016). Therefore, women who use oral contraceptives for more than six months are at higher risk of experiencing skin discoloration, especially if they are frequently exposed to sunlight without protection. In addition to duration of use, other factors such as skin type, family history of melasma, and sun exposure habits also contribute to the worsening of this condition (Ariani & Sariat, 2018). However, research shows that the duration of oral contraceptive use remains the dominant factor contributing to the development of melasma compared to other factors. The estrogen hormone in combined oral contraceptives can increase the activity of melanocytes, the cells responsible for melanin production. Increased melanocyte activity causes melanin pigment to accumulate in certain layers of the skin, ultimately leading to hyperpigmentation. Furthermore, the duration of combined oral contraceptive use is also thought to influence the severity of melasma, as the longer a person is exposed to these synthetic hormones, the greater the likelihood of skin pigmentation changes. Several previous studies have shown a link between combined oral contraceptive use and the incidence of melasma (Kesehatan, 2019).

In oral contraceptive users who have used the pill for less than six months, the pigmentation effects are generally not clearly visible because the hormone exposure has not lasted for a long time. Conversely, with long-term use (>12 months), estrogen and progesterone accumulate in the body, continuously stimulating melanin production (Yanti & Lamaindi, 2021). This condition results in the appearance of increasingly visible melasma patches on the face.

## **Conclusion**

The duration of combined oral contraceptive use can influence the occurrence of melasma in women of childbearing age and those who have used it for more than two years.

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