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The Relationship Between the Use of 3-Month DMPA Injectable Contraception and the Incidence of Spotting among Contraception Users

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Abstract:
The 3-month DMPA injectable contraceptive is widely used because of its effectiveness, convenience, and affordability. However, prolonged use may cause side effects, particularly menstrual disturbances such as spotting, which can affect user comfort and compliance. This study's aimed to analyze the association between the duration of 3-month DMPA injectable contraceptive use and the occurrence of spotting among family planning acceptors. This analytical cross-sectional study involved 30 family planning acceptors selected through purposive sampling. Data were collected using a structured questionnaire and analyzed using the Chi-square test with a significance level of 0.05. Among the 30 respondents, 66.7% had used the 3-month DMPA injectable contraceptive for 1–2 years, and 43.3% experienced spotting. Statistical analysis showed no significant association between the duration of 3-month DMPA use and spotting (p = 0.088). Spotting is a common side effect among users of the 3-month DMPA injectable contraceptive, but it is not significantly associated with the duration of use. Comprehensive counseling and education regarding potential side effects are essential to improve user comfort and contraceptive compliance.

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INTRODUCTION

Rapid population growth continues to pose a significant public health challenge in many developing countries, including Indonesia. Uncontrolled population growth can hinder socioeconomic development, strain healthcare systems, and negatively impact maternal and child health outcomes (Rizkianti et al., 2024). In response, the Indonesian government has long prioritized family planning as a cornerstone of national health policy, aiming to regulate fertility rates and promote sustainable population growth (Hafid, 2025). Central to this strategy is the widespread promotion and accessibility of contraceptive methods, which have proven instrumental in reducing unintended pregnancies and improving reproductive health indicators nationwide (Feriani et al., 2024).

Among the diverse range of contraceptive options available, categorized broadly into hormonal and non-hormonal methods, injectable contraceptives have emerged as particularly popular in Indonesia (Purwoko et al., 2025). Specifically, the 3-month depot medroxyprogesterone acetate (DMPA) is the most commonly used method due to its high efficacy (over 99% when administered correctly), cost-effectiveness, ease of use, and minimal user dependency (Abukres, 2025). Its administration is required only once every 3 months, making it especially suitable for populations with limited access to regular healthcare services, thereby enhancing adherence and continuity of use (Erlank et al., 2023).

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Despite its numerous advantages, DMPA is associated with a range of side effects, the most prevalent being menstrual irregularities (Rajaraman et al., 2024; Widayanti et al., 2024). These disturbances may manifest as amenorrhea, prolonged or infrequent bleeding, or intermenstrual spotting (Monica et al., 2024). Among these, spotting, defined as light, irregular vaginal bleeding occurring outside the normal menstrual cycle, is frequently reported by users, particularly during the first few months of use (Barretta & Grandi, 2025). While generally not harmful from a medical standpoint, spotting can cause significant psychological distress, social discomfort, and concerns about underlying pathology, often leading women to discontinue the method prematurely (Martell et al., 2023).

The discontinuation of effective contraception due to side effects like spotting undermines the goals of family planning programs by increasing the risk of unintended pregnancies (Coulson et al., 2023). Moreover, persistent spotting without adequate counseling or management may contribute to secondary complications such as iron-deficiency anemia or genital irritation from prolonged pad use, potentially elevating the risk of local infections if hygiene is compromised (Rachman et al., 2025). Therefore, identifying factors that influence the occurrence of spotting, including the duration of DMPA use, is critical for improving provider counseling, enhancing user satisfaction, and supporting informed contraceptive decision-making (Bolaang et al., 2025).

Given this context, the present study aims to investigate the relationship between the duration of 3-month DMPA injectable contraceptive use and the incidence of spotting among family planning acceptors at TPMB Amalia Mukhlisoh in Jember, Indonesia. By examining how spotting patterns evolve with continued use of DMPA, this research aims to provide evidence-based insights to inform clinical guidelines, strengthen counseling protocols, and ultimately support sustained contraceptive use in community health settings (Saadah et al., 2023).

METHOD

Study Design

This study employed a quantitative analytic survey with a cross-sectional design. This design was selected to examine the association between the duration of 3-month DMPA injectable contraceptive use and the incidence of spotting by measuring both variables simultaneously at a single point in time. The cross-sectional approach is suitable for identifying relationships between variables within a relatively short period; however, it does not permit causal inference or temporal assessment of the relationship between exposure and outcome.

Population and Sample

The study population consisted of all family planning acceptors using the 3-month DMPA injectable contraceptive at TPMB Amalia Mukhlisoh, Jember. A total of 30 respondents were included in the study, selected purposively. This sampling technique was chosen to ensure that participants met specific inclusion criteria relevant to the research objectives. The inclusion criteria were acceptors who had used the 3-month DMPA injectable contraceptive and were willing to participate in the study. Exclusion criteria included acceptors who were unable to recall or provide complete information regarding their history of spotting.

The sample size of 30 respondents was determined based on the availability of eligible participants during the data collection period. Although no formal power calculation was conducted, the limited sample size is acknowledged as a limitation that may affect the generalizability of the findings.

Volume 04 Number 01
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Variables and Operational Definitions

The independent variable was the duration of 3-month DMPA injectable contraceptive use, categorized into two groups: less than 1 year and 1–2 years. This categorization was based on previous literature indicating that menstrual side effects are more likely to occur within the first two years of hormonal contraceptive use.

The dependent variable was the incidence of spotting, operationally defined as light vaginal bleeding or blood staining occurring outside the regular menstrual period within the last three months, as reported by the respondent. Spotting was categorized as “experienced spotting” and “did not experience spotting.”

Data Collection Instrument

Data were collected using a structured questionnaire adapted from previous studies on injectable contraceptive side effects. The questionnaire included items on respondent characteristics, duration of DMPA use, and history of spotting. Prior to data collection, the questionnaire was reviewed for content validity by a maternal and reproductive health expert. Reliability testing was not conducted, which is acknowledged as a limitation of the study. Data were collected through face-to-face interviews during family planning service visits to minimize missing data and improve response accuracy.

Data Analysis

Data analysis was performed using SPSS software. Univariate analysis was conducted to describe the frequency and percentage distribution of the duration of 3-month DMPA use and the incidence of spotting. Bivariate analysis was conducted using the Chi-square test to assess the association between the duration of DMPA injectable contraceptive use and the incidence of spotting. The Chi-square test was considered appropriate for categorical variables; however, given the small sample size, the results were interpreted with caution. The level of statistical significance was set at $\alpha = 0.05$.

Ethical Considerations

This study was conducted in accordance with the principles of ethical research. Ethical approval was obtained from the appropriate institutional ethics committee prior to data collection by the Faculty of Health Sciences, Institute of Technology, Science and Health, Dr. Soepraoen Hospital. All respondents provided informed consent after receiving an explanation of the study objectives, procedures, potential risks, and benefits. Participant confidentiality and anonymity were strictly maintained throughout the research process.

RESULT

A univariate analysis was conducted to describe the duration of use of 3-month injectable contraceptives and incidence of spotting among family planning (KB) acceptors at TPMB Amalia Mukhlisoh, Jember.

Duration of Use of 3-Month Injectable Contraceptives

Table 1. Frequency Distribution of Duration of Use of 3-Month Injectable Contraceptives among KB Acceptors at TPMB Amalia Mukhlisoh, Jember

Duration of Use	Frequency (n)	Percentage (%)
< 1 year	10	33.3
1–2 years	20	66.7
Total	30	100

Table 1 shows that most respondents (20, 66.7%) had used the 3-month injectable contraceptive for 1–2 years, while 10 respondents (33.3%) had used it for less than 1 year.

Incidence of Spotting

Table 2. Frequency Distribution of Spotting Incidence among KB Acceptors at TPMB Amalia Mukhlisoh, Jember

Spotting Incidence	Frequency (n)	Percentage (%)
Experienced	13	43.3
Not experienced	17	56.7
Total	30	100

Based on Table 2, 13 respondents (43.3%) reported spotting, while the most, 17 respondents (56.7%), did not.

Bivariate Analysis

Table 3. Cross-Tabulation between Duration of Use of 3-Month Injectable Contraceptives and Spotting Incidence at TPMB Amalia Mukhlisoh, Jember

Duration of Use of 3-Month Injectable Contraceptives	Spotting Incidence		Total n (%)	χ^2	p-value
	Experienced n (%)	Not Experienced n (%)			
< 1 year	7 (63.6)	4 (36.4)	11 (100)	2.916	0.088
1–2 years	6 (31.6)	13 (68.4)	19 (100)		
Total	13 (43.3)	17 (56.7)	30 (100)		

Table 3 presents the distribution of spotting incidence according to the duration of 3-month injectable contraceptive use. Among respondents who used the contraceptive for less than 1 year, 7 respondents (63.6%) experienced spotting, while 4 respondents (36.4%) did not. In contrast, among respondents who used the contraceptive for 1–2 years, 6 respondents (31.6%) experienced spotting, and 13 respondents (68.4%) did not.

The Chi-square test yielded a χ^2 value of 2.916 with a p-value of 0.088, indicating no statistically significant association between the duration of use of the 3-month injectable contraceptive and the incidence of spotting.

DISCUSSION

This study found no statistically significant association between the duration of 3-month DMPA injectable contraceptive use and the incidence of spotting among family planning acceptors at TPMB Amalia Mukhlisoh, Jember (χ^2 = 2.916; p = 0.088). Although descriptively spotting was more frequently reported among users with less than one year of use, this difference did not reach

Volume 04 Number 01
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statistical significance. These findings suggest that the duration of DMPA use does not solely determine the occurrence of spotting.

Physiologically, spotting in DMPA users is primarily associated with the effect of prolonged progesterone exposure on the endometrium. DMPA suppresses ovulation and estrogen secretion, leading to endometrial thinning and instability, which can cause irregular bleeding or spotting, especially during the early phase of use (Shaheen et al., 2024). With continued use, endometrial atrophy may occur, leading to reduced bleeding or amenorrhea in some women. However, individual variations in endometrial response and hormonal sensitivity may explain why spotting can still occur in long-term users, as observed in this study (Castillo et al., 2022).

One possible explanation for the absence of a significant association in this study is the limited sample size (n = 30), which may have reduced the statistical power to detect meaningful differences. In addition, spotting was measured based on self-reported recall, which may have introduced misclassification or recall bias. Furthermore, this study did not control for potential confounding factors such as body mass index, nutritional status, hemoglobin levels, stress, physical activity, previous contraceptive use, or adherence to the injection schedule.

Despite these limitations, the findings have important implications for clinical practice, particularly in midwifery and family planning services. Health workers should provide comprehensive counseling at the initiation of DMPA use, emphasizing that spotting is a common and generally harmless side effect, especially during the early months of use. Adequate counseling has been shown to improve client satisfaction, reduce anxiety, and increase continuation rates of injectable contraceptive methods (Challa et al., 2025). Midwives should also inform acceptors that spotting does not indicate contraceptive failure and does not require discontinuation unless accompanied by warning signs such as heavy bleeding, anemia, or severe discomfort (Creinin et al., 2022).

This study has several limitations that should be considered when interpreting the results. The small sample size limits the generalizability of the findings, and the cross-sectional design prevents causal inference. Additionally, reliance on self-reported data may introduce recall bias, and the lack of control for key confounding variables may affect the observed associations. Future studies are recommended to use larger sample sizes, longitudinal designs, and more comprehensive assessments, including hormonal status and injection adherence, to better understand the determinants of spotting among DMPA users.

The results of this study indicate that the duration of 3-month DMPA injectable contraceptive use is not a determining factor for the occurrence of spotting. Instead, spotting appears to be influenced by individual physiological responses and other contributing factors. Strengthening client education and counseling remains essential to ensure comfort, adherence, and sustained use of injectable contraceptive methods (Durante et al., 2023).

CONCLUSION

The duration of 3-month DMPA injectable contraceptive use was not significantly associated with the occurrence of spotting among family planning acceptors at TPMB Amalia Mukhlisoh, Jember. This finding indicates that spotting is a common side effect that may occur regardless of the length of use and does not reflect contraceptive failure. Therefore, healthcare providers should emphasize individualized counseling and education to help acceptors understand and manage spotting, thereby improving comfort and continuation of contraceptive use. Future studies with larger sample sizes and longitudinal designs are recommended to explore further factors associated with spotting among DMPA users.

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