

Literature Review: Association Between DMPA Injectable Contraceptive Use and Menstrual Cycle Disorders in Family Planning Acceptors

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Article Info	Abstract
Article History	Injectable contraception is one of the most popular choices among family planning users in Indonesia. Depo Medroxyprogesterone Acetate (DMPA) injectable contraception is one of the most widely used hormonal contraceptive methods in Indonesia and globally. Despite its high effectiveness in preventing pregnancy, the use of DMPA is known to cause various side effects, particularly disruptions to the menstrual cycle. Menstrual disorders such as amenorrhea, spotting, and irregular bleeding are among the most frequently reported reasons for discontinuation among acceptors, making a comprehensive understanding of their prevalence and underlying mechanisms essential in midwifery practice. This study aimed to identify and analyze the profile of menstrual disorders among DMPA injectable contraceptive acceptors based on findings from previously published studies, as well as to examine the relationship between the duration of DMPA use and the occurrence of menstrual disorders. This study used a literature review design with this systematization mapping evidence from intervention studies 2021–2026 using the PRISMA guide, with searches in Sage, PubMed, Springer Nature, Wiley, etc., via Boolean operators and MeSH keywords: ["Medroxyprogesterone Acetate" OR "Depo-Medroxyprogesterone Acetate" AND "Contraceptive Agents" OR "Contraceptive Effects" AND "Menstrual Cycle"]. Articles were assessed using PICOS and methodological quality (study design, data extraction, risk of bias, synthesis). Of the 309 articles identified, 69 remained after full-text/open access filtering, and 12 after inclusion/exclusion criteria. Results of this study was the 12 articles analyzed, the majority found a significant association between the use of DMPA injectable contraception and menstrual disorders. Amenorrhea was the most dominant disorder, with a prevalence ranging from 50% to 75% across studies. Other disorders identified included spotting (33.3%–74%), hypomenorrhea, polymenorrhea, menorrhagia, and metrorrhagia. Long-term DMPA use (more than one year) was consistently associated with an increased risk of amenorrhea, mediated through suppression of the Hypothalamic–Pituitary–Ovarian (HPO) axis, resulting in decreased levels of FSH, LH, and estradiol, as well as endometrial atrophy. One study reported no significant association (p=0.852), which may be attributed to differences in sample characteristics and measurement methods applied. Conclusionon this study was the use of DMPA injectable contraception is strongly associated with menstrual disorders, particularly amenorrhea, the prevalence
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of which increases with longer duration of use. These disorders arise from hormonal suppression of the HPO axis, leading to inhibition of ovulation and endometrial atrophy.

Introduction

The Family Planning Program (KB) is one of the government’s strategic initiatives to control population growth while improving women’s reproductive health. Among the various contraceptive methods available, injectable contraception is one of the most popular choices among family planning users in Indonesia due to its ease of use, high effectiveness, and affordability. One of the most commonly used types of injectable contraception is Depo-Medroxyprogesterone Acetate (DMPA), also known as the 3-month contraceptive injection, which is a synthetic progestogen preparation that works by suppressing ovulation, thickening cervical mucus, and altering the endometrial environment to make it inhospitable for implantation (Rosidah et al., 2024).

Depo-Medroxyprogesterone Acetate works by administering a 150 mg dose of synthetic progesterone intramuscularly every three months, thereby suppressing ovulation and altering the condition of the endometrium. Although it has high contraceptive efficacy, the use of DMPA is not without various side effects, particularly those related to menstrual cycle disturbances. Pharmacologically, the progesterone in DMPA suppresses Luteinizing Hormone (LH), causing the endometrium to become thinner and atrophic with inactive glands. This condition leads to varied changes in menstrual bleeding patterns, including amenorrhea, oligomenorrhea, polymenorrhea, hypomenorrhea, hypermenorrhea, and spotting or irregular bleeding (Nurhayati and Hamang, 2023).

Various studies have confirmed a significant association between the use of DMPA injectable contraception and menstrual cycle irregularities. Users of DMPA injectable contraception who have been using the method for more than one year are up to 162 times more likely to experience menstrual irregularities compared to users who have been using it for less than one year. The longer the duration of DMPA use, the greater the risk of menstrual cycle disturbances, including amenorrhea, hypermenorrhea, and hypomenorrhea. Another study also found that among users of the 3-month injectable contraceptive, 86.7% experienced oligomenorrhea, a rate far higher than among users of the 1-month injectable (Hidayanti, Dewi dan Sagita, 2024).

Given the high prevalence of DMPA use in Indonesia and its significant impact on users’ menstrual cycles, a systematic and comprehensive literature review is needed to summarize the latest scientific evidence on this topic. This literature review aims to analyze and synthesize existing research findings on the relationship between the use of DMPA injectable contraception and menstrual cycle disturbances in contraceptive users, thereby providing a strong scientific foundation for the development of better contraceptive counseling and the improvement of family planning service quality in health facilities.

Methods

This systematic review the scientific evidence from intervention studies conducted between 2021 and 2026, following the PRISMA statement guidelines, based on a literature search of journal databases, including Sage, PubMed, Springer Nature, Wiley, and other databases. The literature search strategy utilized Boolean operators. Keywords were based on Medical Subject Headings, specifically [“Medroxyprogesterone Acetate” OR “Depo-Medroxyprogesterone Acetate” AND “Contraceptive Agents” OR “Contraceptive Effects” AND “Menstrual Cycle”]. Selected articles were assessed using the PICOS framework shown in Table 1 below.

Table 1. Inclusion and exclusion criteria for the systematic review based on the PICOS framework.

Component	Inclusion Criteria	Exclusion Criteria	
Population	Women of reproductive age, at least 18 years old	Adolescents and pregnant women	
Intervention	DMPA and injectable contraception		
Outcome	Menstrual bleeding, menstrual cycle	Oral Contraception	
Study design	Observational and experimental studies from 2021 to 2026	Sexually Infections	Transmitted
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The article selection process was evaluated based on methodological quality, focusing on the accuracy of study design selection, data extraction, risk of bias, and synthesis of results (Herliawati *et al.*, 2026). The literature search workflow was designed in accordance with PRISMA standards, and checks for duplication and readability were conducted. During the identification phase, a total of 309 articles were identified; these were then filtered using the criteria “free full text” and “open access,” leaving 69 articles. These articles were subsequently selected based on predefined inclusion and exclusion criteria grounded in the PICOS framework, resulting in 12 articles. The literature study identification flowchart is presented in Figure 1.

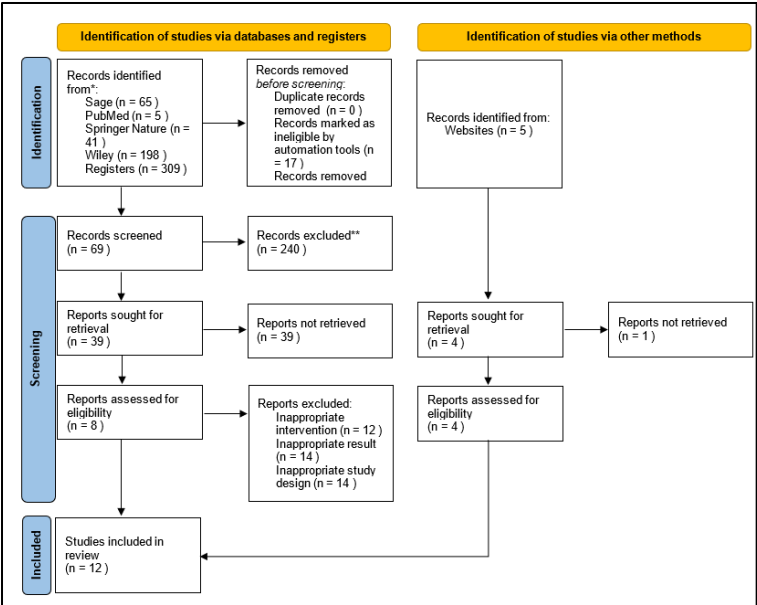


Figure 1. PRISMA Diagram

Articles with observational, experimental, or RCT study designs were extracted based on authors, year, variables, participants, interventions and comparisons, measurements, outcomes, and analysis. All articles were assessed for risk of bias using the JBI Critical Appraisal.

Results and Discussion

A literature review was conducted on 12 articles. The articles were published between 2021 and 2026. The results of the journal analysis are presented in Table 2 as follows:

Table 1. Article Research

No	Researchers	Research methods	Results
1.	Depo Medroxyprogesterone Acetate (DMPA): Long-Term Effects on Menstrual Cycle Disorders (Nurhayati, S and Hamang, 2023)	- Design: analytical study - Sample: 102 women who had been using DMPA for less than 1 year and more than 1 year - Variable: menstrual cycle irregularities - Instrument: Checklist	- The duration of DMPA use affects the menstrual cycle - A common side effect of DMPA use is hypermenorrhea
2.	Acceptance, Adherence, and Side Effects of Depot Medroxyprogesterone Acetate: A Prospective Observational Study (Rajaraman, Vaithilingan and Selvavinayagam, 2024)	- Design: observational study - Sample: 40 women in rural areas - Variables: acceptance, initiation - Instrument: Self-administered structured questionnaire	The rate of discontinuation of DMPA after the third month increases due to irregular bleeding and amenorrhea.
3.	Relationship between the duration of injectable contraceptive Depo MedroxyProgesterone Acetat (DMPA) With the Occurrence of Amenorrhea in Family Planning Acceptors at the	This study employed an analytical survey method using a cross-sectional approach. The study population consisted of patients using DMPA injectable contraception at the Delima Rahayu Primary Clinic in Sragen during May and June 2023. The total sample size was 112 participants. The Chi-square test was used for statistical analysis.	The duration of DMPA use affects the menstrual cycle, such as causing amenorrhea. Statistical data reveal a strong correlation (p-value 0.001 < 0.05).

	Pratama Delima Rahayu Clinic, Sragen (Manek, Prastyoningsih dan Pangesti, 2024)		
4.	A study on injectable DMPA (Depomedroxy Progesterone Acetate) and effect of its use as a short term contraception in immediate postpartum women (Shah, Asghar dan Rafiq, 2023)	Study Design: This study is a prospective observational study. The study was conducted at the Department of Gynecology, Ayub Teaching Hospital, Abbottabad, Pakistan. Study Group: 130 women who received a 150 mg intramuscular injection of DMPA upon discharge from the hospital and again after three months. Control Group: 130 postpartum women who did not use any hormonal contraception. T-test, chi-square test.	The use of DMPA causes weight gain and changes in the menstrual cycle, such as amenorrhea. Irregular bleeding was reported by 96 women (74%), and 70% reported amenorrhea after 1 year of use.
5.	Multiple complications associated with prolonged depot medroxyprogesterone acetate treatment. Case report and mini-review of literature (Witczak et al., 2023)	This study employs a case report design supplemented by a mini-literature review. It is not an experimental study or an RCT, but rather a clinical descriptive study of a single patient, which is then supported by a literature review of various previous studies.	Hormone test results show signs of hypothalamic-pituitary-ovarian (HPO) axis suppression: indicating an irregular menstrual cycle due to prolonged disruption of HPO axis recovery. In addition to menstrual irregularities, osteopenia, DVT, and insulin resistance
6.	Side Effects of the Depo-Medroxyprogesterone Acetate (DMPA) Injectable Contraceptive at BPM Fitri Hayati (Setyoningsih, 2020)	A descriptive study using a cross-sectional approach. The subjects of this study were women using the DMPA injectable contraceptive at the Fitri Hayati Family Planning Clinic, with a total of 51 respondents. Univariate analysis was used.	Of the 51 respondents, 31 (60.8%) experienced menstrual irregularities in the form of amenorrhea, and 17 (33.3%) experienced menstrual irregularities in the form of spotting,
7	Adverse Drug Reaction of Medroxyprogesterone Acetate Injectable Contraceptive on Acceptor Family Planning Programme (Pardilawati et al., 2022)	This cross-sectional analytical observational study conducted in Jungai Village, South Sumatra, involved a sample of 97 people. Using descriptive analysis,	The results showed that 75% of recipients experienced menstrual disorders such as amenorrhea, menorrhagia, metrorrhagia, and spotting
8	The Relationship Between Duration of Use of the 3-Month Injectable Contraceptive and Menstrual Disorders Among DMPA Injectable Contraceptive Recipients at the Eka Rizki Kurniati Penawartama Health Center in Tulang Bawang in 2023 (Hidayanti, Dewi dan Sagita, 2024)	An analytical survey using a cross-sectional approach at the Eka Rizki Kurniati Family Planning Clinic in Penawartama, Tulang Bawang, in 2023. The sample for this study consisted of 35 family planning clients, and the sampling technique used was accidental sampling. The statistical test used was the chi-square test.	After one year of using injectable birth control, about 50% of women stop menstruating. Menstrual irregularities that may occur include spotting, irregular bleeding, amenorrhea, and changes in the frequency, duration, and amount of menstrual flow
9	Insights from Client Experience with Injection Medroxyprogesterone Acetate (MPA) in India: Lessons from the Field (Agrawal et al., 2022)	Design: observational study Sample: 480 outpatients at a tertiary care hospital Variable: side effects of DMPA injections Instrument: questionnaire	Menstrual irregularities were found to be a common side effect in 48.5% of women.

10	The Relationship Between Injectable Contraceptives and Menstrual Cycle Disorders(Rosita dan Aini, 2024)	This study is an observational analytical study. The sample consisted of 50 women at the Jepara Family Planning Clinic who had been using either the 3-month or 1-month injectable contraceptive for at least 6 months, selected using accidental sampling.	There is an association between menstrual cycle disorders and users of injectable contraceptives (p-value 0.004 < 0.005); 70% of respondents reported amenorrhea, 12% reported hypomenorrhea, and 10% reported polymenorrhea.
11	The Relationship Between Duration of Contraceptive Use and Menstrual Cycle Disorders Among Injectable Contraceptive Users at PMB Husniyati (Saswita, Emilda dan Agustin, 2024)	A quantitative descriptive method using a cross-sectional approach with a sample size of 96 participants. Results obtained from bivariate analysis using the chi-square test	There was no association between the duration of contraceptive use and menstrual cycle irregularities among injectable contraceptive users at the Husniyati Family Planning Clinic in Palembang in 2023, with a p-value of 0.852. The majority of respondents—75.0%—did not experience menstrual cycle irregularities, while only 25.0% did.
12	Revisiting depot medroxyprogesterone (Mehta, Kale and Rashid, 2021)	- Design: prospective study - Sample: 104 female patients - Variables: efficacy, side effects, treatment adherence - Instruments: simple interviews, clinical observation forms, medical records in Delhi.	The findings consisted of side effects related to menstrual disorders, particularly amenorrhea (50%) and irregular bleeding (25%). Irregular bleeding was a common side effect observed at the 1-year follow-up in 50.96% of respondents.

A literature review of 12 articles published from 2021 until 2026 consistently shows that the use of DMPA injectable contraception is strongly associated with the occurrence of menstrual disorders among contraceptive users. The most commonly reported disorders include amenorrhea, spotting, hypomenorrhea, hypermenorrhea, and irregular bleeding.

Prevalence of Menstrual Disorders

Among all the studies reviewed, amenorrhea was the most commonly reported menstrual disorder. (Setyoningsih, 2020) found that 60.8% of respondents experienced amenorrhea, while a study by (Shah, Asghar dan Rafiq, 2023) reported an amenorrhea rate of 70% after one year of use. (Rosita dan Aini, 2024) also found that 70% of respondents complained of amenorrhea, and (Mehta, Kale and Rashid, 2021) reported a similar rate of 50%. In addition to amenorrhea, irregular bleeding is also a fairly common complaint, with (Shah, Asghar dan Rafiq, 2023) reporting a rate of 74%, and (Pardilawati et al., 2022) noting that 75% of users experienced various forms of menstrual disorders, including amenorrhea, menorrhagia, metrorrhagia, and spotting.

Amenorrhea (cessation of menstruation) consistently emerges as the most frequently reported disorder in nearly all studies. Data from each study indicate a fairly wide range of amenorrhea prevalence: (Setyoningsih, 2020): 60.8% of 51 respondents experienced amenorrhea. (Rosita and Aini, 2024): 70% of 50 users experienced amenorrhea. (Shah, Asghar, and Rafiq, 2023): 70% experienced amenorrhea after 1 year of use. (Mehta, Kale, and Rashid, 2021): 50% of 84 women experienced amenorrhea. (Pardilawati et al., 2022): 75% of users experienced various menstrual disorders, including amenorrhea. (Hidayanti, Dewi, and Sagita, 2024): approximately 50% of women stopped menstruating after one year of use. Additionally, the reason women stopped using DMPA after the third month increased due to irregular bleeding and amenorrhea (Rajaraman, Vaithilingan and Selvavinayagam, 2024).

This high prevalence is consistent with findings from other studies outside the scope of this review, which reported secondary amenorrhea in 66.3% of DMPA users with a duration of use of ≥ 24 months. This underscores that amenorrhea is not merely a minor side effect, but rather a predictable physiological response to long-term DMPA use. In addition to amenorrhea, other disorders were also reported with significant prevalence. In a study (Setyoningsih, 2020), 33.3% of respondents experienced spotting, and a study by Shah et al. (2023) reported irregular bleeding in 74%. Rosita & Aini (2024) also noted hypomenorrhea (12%) and polymenorrhea (10%) among their users. (Nurhayati, S and Hamang, 2023) also reported that a common effect of DMPA use is hypermenorrhea. This pattern indicates that menstrual disturbances are progressive: irregular bleeding and spotting dominate at the start of use, then gradually progress to amenorrhea with prolonged use. Menstrual irregularities were found to be a common side effect in 48.5% of women, as reported by a study (Agrawal et al., 2022).

The high prevalence of these menstrual disorders can be comprehensively explained by DMPA's mechanism of action on the hypothalamic-pituitary-ovarian (HPO) axis. DMPA contains synthetic progesterone that acts through three main pathways: (1) Suppression of GnRH in the hypothalamus: Progesterone in DMPA binds to progesterone receptors in the hypothalamus and inhibits the secretion of Gonadotropin-Releasing Hormone (GnRH), thereby significantly reducing the frequency of GnRH pulses. (2) Decrease in FSH and LH in the anterior pituitary. The reduction in GnRH leads to decreased secretion of Follicle-Stimulating Hormone (FSH) and Luteinizing Hormone (LH). The decrease in FSH inhibits the development of the Graafian follicle, while the absence of the mid-cycle LH surge prevents ovulation. (3) Endometrial atrophy Without adequate estrogen stimulation and due to the direct effects of progesterone, the endometrium becomes thin, shallow, and atrophic with inactive glands. This condition results in an insufficient endometrial lining to shed, so menstruation does not occur (amenorrhea).

Laboratory tests of a patient on long-term DMPA therapy showed FSH levels of 3.97 mIU/mL, LH levels of 1.85 mIU/mL, and estradiol levels of 96.94 pg/mL all of which were low, indicating significant inhibition of the HPO axis. Under normal physiological conditions, the menstrual cycle is regulated by a balanced feedback mechanism between the hypothalamus, pituitary gland, and ovaries. Estrogen produced by developing follicles provides positive feedback to the pituitary gland to trigger an LH surge, thereby causing ovulation and allowing the menstrual cycle to proceed normally. However, in DMPA users, exogenous progesterone creates dominant negative feedback (progesterone negative feedback) on the hypothalamus and pituitary, so that the signal to initiate a new follicular cycle is continuously suppressed. This explains why the longer DMPA is used, the greater the likelihood of menstrual disturbances, particularly amenorrhea, as demonstrated by the majority of studies in this review.

The Relationship Between Duration of Use and Menstrual Disorders

The majority of studies indicate a significant correlation between the duration of DMPA use and the occurrence of menstrual disorders. Diyanasri, Tat, and Gatum (2023) found that amenorrhea occurs more frequently among long-term users, whereas other bleeding disorders such as spotting tend to appear early in the course of use. (Manek, Prastyoningsih, and Pangesti, 2024) also confirmed this with a p-value of 0.001 (< 0.05), indicating a strong association between usage duration exceeding one year and an increased risk of menstrual cycle disorders. (Hidayanti, Dewi dan Sagita, 2024) add that after one year of use, approximately 50% of women cease menstruating, demonstrating the cumulative effect of DMPA on the reproductive system.

Other Associated Side Effects

In addition to menstrual irregularities, several studies have also noted other significant side effects. (Shah, Asghar dan Rafiq, 2023) reported weight gain in postpartum DMPA users, while (Witczak et al., 2023) documented serious complications such as osteopenia, Deep Vein Thrombosis (DVT), and insulin resistance with long-term use. These findings underscore the need for comprehensive counseling for users before choosing the DMPA injectable contraceptive, particularly for long-term users.

Although the majority of studies found a significant association, one study yielded different results. (Saswita, Emilda dan Agustin, 2024) reported no significant association between the duration of injectable contraceptive use and menstrual cycle irregularities at the Husniyati Family Planning Clinic in Palembang (p-value 0.852), with 75% of respondents not experiencing cycle irregularities. This discrepancy is likely influenced by variations in respondent characteristics, differing durations of use, and differences in the methods used to measure menstrual irregularities across studies.

The findings of this literature review have important implications for midwifery practice and family planning services. Midwives and health care providers need to provide adequate counseling to prospective DMPA users regarding the possibility of menstrual irregularities, particularly amenorrhea, as a common and predictable side effect. Ongoing monitoring of users, especially those who have been using DMPA for more than one year, is necessary to detect further complications such as metabolic disorders and decreased bone density.

Conclusion and Recommendations

A review of 12 articles (2021–2026) confirms that DMPA injectable contraception is consistently associated with menstrual disorders, with amenorrhea being the most prevalent (50–75%) and spotting occurring in 33.3–74% of early users. Eleven of 12 studies found a significant association between duration of DMPA use and menstrual disorders; users exceeding one year of use face a substantially higher risk of amenorrhea (OR = 162,000 in one study). Only one study (Saswita et al., 2024; $p = 0.852$) found no significant association. These findings highlight the critical role of midwives in delivering pre-use counseling on menstrual side effects and conducting ongoing monitoring particularly for long-term users at risk of

amenorrhea, osteopenia, and impaired fertility recovery to support informed contraceptive decision-making.

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