

Factors affecting weight gain among injectable contraceptive users in Indonesia: A Literature Review

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Abstract

Weight gain is one of the common side effects reported by users of injectable contraception, particularly the DMPA type containing the hormone progesterone. This study aims to analyze the factors influencing weight gain among users of injectable contraception. Through a literature review, the study identifies those hormonal factors, duration of use, diet, physical activity, age, and psychological and social factors that play significant roles in weight changes. Progesterone can stimulate the appetite control center in the hypothalamus, increasing appetite and affecting body metabolism. The longer the duration of use, the more significant the weight gain. Lifestyle factors, such as high-calorie diets and low physical activity, exacerbate the hormonal side effects

Keywords: Injectable Contraception; Weight Gain; Progesterone Hormone; Duration of Use; Lifestyle

1. Introduction

Weight is one of the many important parameters to assess a person's body mass. Weight balance needs to be maintained to avoid health problems that result from excess or underweight. An imbalance between nutrient intake and expended energy can lead to weight gain, which if continued, has the potential to lead to obesity. Obesity is a condition of excessive accumulation of body fat that interferes with health. A person can be categorized as obese if the Body Mass Index (BMI) reaches or exceeds 25. This condition is not only influenced by diet but also by other factors, such as the use of hormonal contraceptives.

Contraception is an important part of Family Planning (KB) efforts which has the function of helping married couples regulate the number and distance of pregnancies. According to the World Health Organization (WHO), family planning improves the health of couples of childbearing age by preventing unwanted or unintended pregnancies and reducing health risks related to pregnancy (1). In Indonesia, injectable contraception is one of the most commonly chosen methods of birth control because of its practical and effective method. There are two types of injectable contraceptives, namely monthly injections that contain a combination of estrogen and progesterone hormones, and 3-monthly injections (DMPA) that contain only the hormone progesterone (2).

However, the use of injectable contraceptives can have side effects that are often complained about, one of which is weight gain. This effect is especially felt by users of DMPA injectable contraceptives, which are known to improve appetite control in the hypothalamus (1). As a result, users experience an increase in appetite which can trigger an increase in weight. This weight gain is one of the reasons that affects the sustainability of the use of injectable contraceptives by birth control acceptors.

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Weight gain in injectable contraceptive acceptors can also be affected by other factors, namely age, diet, and physical activity. Therefore, birth control acceptors must understand the extent to which the use of injectable contraceptives contributes to weight changes, especially for reproductive health and quality of life of birth control acceptors. This can help healthcare providers provide better education to prospective injectable contraceptive users.

2. Material and methods

This literature review uses a systematic approach to identify and analyze relevant literature. Data sources are obtained through literature searches on Google Scholar and trusted health journals. Keywords used in searches include "injectable contraceptives," "weight gain," and "contraceptive side effects." From the search results, 10 articles were obtained that met the research criteria for analysis. The inclusion criteria for the selected articles were articles that discussed the relationship between injectable contraceptives and body weight, published in the last 10 years, and available in Indonesian or English. Articles that are not relevant to the topic or do not include empirical data are excluded from the analysis. The analysis is carried out by reading each article in depth, identifying the results of the research, and comparing findings from various sources. The results of the analysis of the selected literature were then summarized to find patterns of findings related to weight gain factors in DMPA injectable contraceptive acceptors. This systematic approach ensures that the resulting literature reviews are not only descriptive but also provide in-depth insights into the topics discussed.

3. Results and discussion

The results of the research used a literature review method regarding factors in increasing the body weight of DMPA injection users sourced from various national journals that correspond to topics used by the author. Journal searches via Google Scholar are filtered based on inclusion and exclusion. The criteria for using images are as follows:

Table 1 The result of the literature search that will be analyzed against 10 scientific journals obtained the following results

No.	Researcher	Research Method	Time Research	Result
1	Dompas, R (2018)	This research is a Descriptive quantitative with a cross-sectional design.	This study was conducted from March to April 2018 at Ranotana Weru Public Health Center, Wanea District, Manado City.	Respondents aged 20-35 years had a higher proportion of weight gain compared to respondents in other age groups, with a p-value of 0.01, indicating statistical significance. Additionally, dietary patterns that frequently included high-calorie and high-fat foods also contributed to weight gain, with a p-value of 0.01. Low physical activity, where most respondents engaged in light physical activities, was also associated with weight gain, with a p-value of 0.04.
2	Sari, V., & Afridah, W. (2020)	The study used the literature review method.	This research was published in December 2020.	The progesterone hormone in DMPA plays a role in stimulating appetite and altering fat metabolism, which can lead to fat accumulation under the skin. Additionally, hormonal changes resulting from long-term use can disrupt the balance between estrogen and progesterone, further contributing to weight gain in injectable contraceptive users.
3	Marbun, U (2018)	This research is a Descriptive quantitative with a cross-sectional design.	The research was conducted from December to April 2018 at Tanralili Health Center, Maros Regency, South Sulawesi.	One of the main factors that can lead to weight gain is the hormone present in injectable contraceptives, particularly progesterone. This hormone alters the metabolism of carbohydrates and sugars into fat, which causes fat accumulation under the skin. Additionally, DMPA (Demo-

				Proverb), used in injectable contraceptives, can also affect the appetite control center in the hypothalamus, potentially increasing appetite. If not balanced with adequate physical activity, this increased appetite can lead to weight gain in the user.
4	Puspitasari, Y., Nurhanifah, T., & Maharani, K. (2024).	The research method used was an analytic survey with a cross-sectional design.	This research was published in December 2024.	Physical activity significantly impacts weight change, with a p-value of 0.040 ($p < 0.05$), indicating that the more physically active individuals are, the less likely they are to experience weight gain. Additionally, this study also notes that the duration of injectable contraceptive use is related to weight changes, where respondents who used contraceptives for less than one year tended not to experience weight gain compared to those who used contraceptives for more than one year.
5	Afrilia, L., Fitri, A., Sitanggang, H. D., Perdana, S. M., & Wisudariani, E. (2024).	This research is a quantitative study with a cross-sectional design	The research was conducted in 2022 at Simpang IV Sipin Health Center, Jambi City.	Physical activity and dietary patterns significantly influence weight gain, with p-values of 0.0005 for each, indicating a significant relationship. Additionally, age plays an important role, with respondents aged 20-35 experiencing a higher weight gain compared to other age groups, with a p-value of 0.003.
6	Muayah, M. (2022).	This research is a Descriptive quantitative with a cross-sectional design.	The research was conducted in 2021.	Users with low levels of physical activity tend to experience greater weight gain. This aligns with the understanding that a lack of physical activity can lead to the accumulation of unused calories in the body, which is a primary cause of weight gain. With an odds ratio of 7.901, physical activity has been shown to have a strong influence.
7	Liando, H., Kundre, R., & Bataha, Y. (2015).	This research is a Descriptive quantitative with a cross-sectional design.	The research was conducted in 2014.	Long-term use of DMPA can contribute to weight gain, which may be caused by hormonal changes that affect metabolism and appetite. Additionally, the physical activity levels of the respondents tend to be low, with most engaging in heavy physical activities that are not sufficient to reduce or maintain their weight.
8	Safira, I. (2024).	This study is a quasi-experimental research with a pre-test post-test design.	The research was conducted in 2023.	The use of hormonal contraceptives, particularly injectables, has a significant impact on weight changes. This study involved 120 respondents and found that the progesterone hormone in injectable contraceptives can increase appetite. In addition to hormonal factors, irregular eating patterns and the habit of consuming high-calorie foods also contribute to weight gain. Psychological and social factors, such as stress and social support, also influence eating habits and physical activity in users.

9	Damayanti, E., Azza, A., & Salsabila, Y. (2024).	This research is a Descriptive quantitative with a cross-sectional design.	The research was conducted in 2023.	This study concludes that although mothers with a family history of being normal weight or overweight may experience weight gain, long-term use of injectable contraceptives poses a higher risk of causing weight gain. This is because the progesterone hormone can stimulate increased appetite and alter the body's metabolism.
10	Ahmaniyah, A., & Fitriah, F. (2021).	This is a quantitative study with an analytical observational design and a cross-sectional design.	The research was conducted in 2020.	The study notes that weight gain can occur within the first year of use, with a significant average increase in weight after 3-5 years of use. Other contributing factors include changes in metabolism that cause the conversion of carbohydrates and sugars into fat, as well as a decrease in physical activity, which is common among users.

Based on a literature review of ten articles discussing weight gain in injectable contraceptive users, several interrelated key factors emerge. The first factor is hormonal changes caused by the use of injectable contraceptives, particularly those containing the hormone progesterone. This hormone is known to affect the body's metabolism by converting carbohydrates and sugars into body fat, leading to fat accumulation under the skin. Additionally, progesterone can increase users' appetite (3).

The second factor is the duration of injectable contraceptive use. Research shows that users who have been on injectable contraceptives for more than a year tend to experience significant weight gain, averaging between 1-5 kg per year. This is supported by studies indicating that weight gain becomes more significant after three to five years of use (10). Long-term use not only affects metabolism but also disrupts the balance between estrogen and progesterone hormones, which further contributes to weight gain.

In addition, dietary patterns and physical activity are also important factors influencing the weight of injectable contraceptive users. Studies have found that unhealthy eating habits and low physical activity have a significant relationship with weight gain (5). This suggests that an imbalanced lifestyle can exacerbate the hormonal side effects of injectable contraceptives. For instance, it has been noted that low physical activity levels have an odds ratio of 7.901 in influencing weight gain (6).

Age is another important factor identified in several studies. It has been observed that individuals aged 20-35 are more prone to experiencing weight gain compared to other age groups (5) (1). This may be linked to differences in metabolism across age groups, as well as the more dynamic lifestyle characteristic of individuals in this age range. In addition to biological and lifestyle factors, psychological and social aspects also play a role in weight changes. It has been suggested that stress and social support can significantly affect users' eating habits and physical activity levels. These factors, often overlooked, can have a significant impact on the side effects of injectable contraceptive use (8).

4. Conclusion

Overall, weight gain in injectable contraceptive users is the result of a complex interaction between hormonal factors, duration of use, diet, physical activity, age, as well as psychological and social aspects. Therefore, comprehensive education on healthy lifestyle practices should be provided by healthcare professionals to users to minimize these side effects. This educational approach should include information about healthy eating habits, the importance of sufficient physical activity, and effective stress management techniques. The aim is to minimize the negative impact on the physical and mental health of injectable contraceptive users and enhance their quality of life after using contraception. Additionally, the role of social support and effective communication between healthcare professionals and users is crucial to ensure that every user feels supported and understands the risks and how to manage potential side effects. In this way, the use of injectable contraceptives can be carried out safely and effectively without compromising the overall well-being of the users.

Compliance with ethical standards

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Disclosure of conflict of interest

The author declares no potential conflict of interest

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