



## THE RELATIONSHIP BETWEEN INJECTABLE CONTRACEPTION AND BODY MASS INDEX (BMI) AND AMENORRHEA

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### ABSTRACT

The Indonesian government has established a Family Planning policy to regulate the distance and age of birth in the hope of reducing the problem of population density which can result in various problems in Indonesia. One type of contraception that is an option is hormonal birth control in the form of injections, both 1-month and 3-month injections. The use of hormonal contraceptives has various risk factors, including weight gain and menstrual cycle disorders. The purpose of this study was to determine the effect of the relationship between 3-month contraception and body mass index (BMI) and the incidence of amenorrhea. This type of research is an analytical survey with a cross sectional approach. The sample in this study was taken using a purposive sampling technique that was in accordance with the inclusion and exclusion criteria. Data collection techniques by distributing questionnaires, interviews and measuring weight and height. The analysis used the Chi Square test and obtained a p value of 0.000, OR=15,0 on duration of contraception with Body Mass Index and p value of 0,001, OR=0,20 on amenorrhea. The conclusion of this study shows that there is an effect of the duration of 3 months of contraceptive use on body mass index and amenorrhea. Therefore it is hoped that health workers and acceptors can always communicate, especially regarding the side effects of contraception

Keywords: amenorrhea; body mass index (BMI); contraception

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## INTRODUCTION

One of the population problems in Indonesia is the problem of quality and population density, namely the high number of people (Anggraini, D. et al., 2021) The Indonesian government continues to strive to reduce the rate of population growth, namely by establishing a Family Planning policy which aims to be able to regulate births, spacing and gestational age, to realize a balanced growing population and quality families through the implementation of family planning programs (Rahman et al., 2017). Contraception is a temporary and permanent effort to prevent pregnancy. Contraceptive methods are divided into 2 types, namely non-hormonal consisting of the Lactation Amenorrhoea Method (LAM), condoms, intrauterine contraceptives (AKDR) and stable contraception, while hormonal contraceptives contain progestin and combinations in the form of pills, implants and injections. One type of contraception that is an option and is very effective, safe, does not interfere with marital relationships, is simple, cheap is hormonal birth control in the form of injections, both 1 month and 3 month injections. Although until now there is no 100% ideal method of composition (Ibrahim, 2016; Yanti, L. & Lamaindi, 2021).

According to (BKKBN, 2014), data from SDKI (Indonesian Demographic and Health Survey) the use of hormonal contraceptives is getting an increase in percentage every year, of all other hormonal contraceptive methods around 50% are injectable contraceptive users. The number of Active Family Planning participants in South Sumatra in 2021 according to the type of contraceptive device is 81.4% and most of them choose injectable contraceptives, which is 57.6% (DinKes Sumsel, 2022).Injectable contraception is an effective contraceptive method, which in its use has a relatively high effectiveness or continuity rate and a relatively low failure rate, when compared to simple contraceptives.(Jannah & Rahayu, 2017). The use of hormonal contraceptives has various risk factors. Estrogens contained in hormonal contraceptives can cause fluid retention and edema, while progesterone can convert carbohydrates and sugars into fat and affect the hypothalamus to the pituitary tract which stimulates increased appetite so that it can cause weight gain in contraceptive users and obesity (Hamidah & Damayanti, D., 2021).

One of the most common ways to measure obesity is to use the Body Mass Index (BMI). Based on health research data in 2018, obesity in women with a BMI of > 25 and at the age of > 18 years is 32.9%, one of the causative factors is hormonal contraceptives in women of reproductive age (Hamidah & Damayanti, D., 2021; Robinson, J. & Burke, A., 2013).Based on the results of the study (Fitriah et al., 2021) showed that there was a relationship between the duration of 3-month injectable birth control acceptors and weight gain as shown by the results of the Spearman's rho statistical test, which was  $p=0.032$ , out of 124 respondents as many as 79.8% of 3-month injectable birth control acceptors experienced weight gain.According to (Jannah & Rahayu, 2017) The problems that often occur in the use of 3-month injectable hormonal contraceptives are menstrual disorders, namely spotting and amenorrhea and can gain weight by about 2.3 kilo grams in the first year and increase for 6 years. Research from (Sinaga, 2021), out of 53 respondents, 16 respondents experienced menstrual disorders in short-term use and 37 respondents in the long term. The results of the Chi-Square statistical test found that there was a relationship between the duration of using injectable contraceptives for 3 months and menstrual disorders, namely with a p-value of 0.003 (<0.05).

Based on data obtained from PMB Lismarini, the number of active birth control acceptors in 2022 is 1,630 people, with around 60% of them using 3-month injectable birth control. The results of interviews with 10 3-month injectable contraceptive birth control acceptors conducted by the author, it was found that 3-month injectable birth control acceptors experienced side effects from contraception, including menstrual disorders, dizziness, spotting, amenorrhea and weight gain. This study aims to determine the relationship between the long use of 3-month injectable contraceptives and the incidence of Body Mass Index (BMI) and the incidence of amenorrhea..

## **METHOD**

This type of research is quantitative, using observational analysis with a cross-sectional design approach. The population of this study is all 3-month injectable contraceptive acceptors who come to PMB Lismarini. The sampling technique uses purposive sampling, in accordance with the criteria of exclusion and inclusion research, which is 93 respondents and has been given an explanation of research ethics and agreed to be a respondent. The dependent variable was the duration of injectable contraceptive use for 3 months while the independent variable was Body Mass Index (BMI) and amenore in the respondents. The data collection technique uses primary data, namely by providing questionnaires and questionnaires to find out the incidence of amebore in respondents and using tools in the form

of weight scales and micotoses to find out the respondents' Body Mass Index (BMI). Data analysis to determine the long-term relationship between 3-month injectable contraceptive use and Body Mass Index (BMI) and amenorrhea was used using the Chi-square test with a value of  $p = 0.005$ .

## RESULTS

The Respondent's characteristics in this study are based on the grouping of age, education, occupation, length of use and amenorrhea.

Table 1.  
Respondent's characteristics (n= 93 )

Respondent's Characteristics	f	%
Age		
>20 -35 Y.o	58	62,4
>35 Y.o	35	37,6
Education		
Primary school	5	5,4
Junior High School	18	19,4
Senior High School	63	67,7
College	7	7,5
Job		
Housewives Self	87	93,5
Employed	6	6,5
Long Usage		
≤ 1 Y.o	27	29,0
> 1 Y.o	66	71,0
Amenorrhea		
Amenorrhea	62	66,7
No Amenorrhea	31	33,3

Table 1, it can be seen from the number of samples of 93 respondents, 58 respondents (62.4%) with an age of >20-35 years, 63 respondents (67.7%) with high school education, 87 respondents (93.5%) with housewife work (IRT), 66 respondents (71%) with > 1 year of contraceptive use and 62 respondents (66.7%) who experienced amenorrhea

Table 2.  
The Long Relationship of 3-Month Injectable Contraceptives with Body Mass Index

Long Usage	Body Mass Index				Total		p-value
	Normal		Overweight		f	%	
	f	%	f	%			
< 1 Y.o	25	92,6	2	7,4	27	29	0,000
> 1 Y.o	30	59,1	36	40,9	66	71	
Total	55	59,1	38	40,9	93	100	

Table 2, the results were obtained from 66 respondents (71.0%) who used injectable contraception for 3 months > 1 year, 36 respondents (40.9%) experienced the overweight category, while of the 27 respondents who used injectable contraception for 3 months < 1 year, 2 respondents (2.15%) experienced BMI in the overweight category. Based on the results of the analysis test, the results of  $p=0.000$  ( $p<0.05$ ) and  $OR=15.0$  were obtained, which means that there is an influence between the duration of 3-month use of injectable contraceptives and BMI

Table 3.  
The Relationship between 3-Month Injectable Contraception and Amenorrhea

Long Usage	Amenorrhea				Total		p-value
	Amenorrhea		No Amenorrhea		f	%	
	f	%	f	%			
< 1 Y.o	11	11,8	16	17,2	27	29	0,001
> 1 Y.o	51	54,8	15	16,1	66	71	
Total	62	66,7	31	33,3	93	100	

Table 3, the results of 66 respondents (71.0%) who used injectable contraception for 3 months > 1 year were obtained, 51 respondents (54.8%) experienced amenorrhea. Meanwhile, of the 27 respondents (29.0%) who used injectable contraception for 3 months < 1 year, 11 respondents (11.8%) experienced amenorrhea. Based on the results of the analysis test, the results of the value of  $p=0.001$  ( $p<0.05$ ),  $OR = 0.20$  were obtained, which means that there is an influence between the duration of 3-month use of injectable contraceptives and amenorrhea. Based on Table 3, the results of 66 respondents (71.0%) who used injectable contraception for 3 months > 1 year were obtained, 51 respondents (54.8%) experienced amenorrhea. Meanwhile, of the 27 respondents (29.0%) who used injectable contraception for 3 months < 1 year, 11 respondents (11.8%) experienced amenorrhea. Based on the results of the analysis test, the results of the value of  $p=0.001$  ( $p<0.05$ ),  $OR = 0.20$  were obtained, which means that there is an influence between the duration of 3-month use of injectable contraceptives and amenorrhea

## DISCUSSION

### Respondent Characteristics

Based on Table 1. It can be seen from the number of samples of 93 respondents, most of the respondents aged >20-35 years are 62.4%, 67.7% have a high school education, 93.5% are housewives (IRT), 71% have been using contraceptives > 1 year and 66.7% have amenorrhea. The mechanism of action of 3-month injectable birth control is to increase progesterin levels so that it inhibits the levels of hormones LH and FSH which ultimately inhibit the follicles and prevent ovulation from occurring. 3-month injectable birth control can also make the endometrium less good (Matahari et al., 2018)Based on research (Mutia & Kamsatun, 2017), it was stated that out of 56 respondents there were 39 respondents who used contraception for more than 1 year and 36 respondents experienced menstrual disorders. The results of the Chi Square statistical test obtained a p value of 0.000 so that there was a relationship between the use of injectable contraceptives and amenorrhea. Research (Mardhika et al., 2021), found that of the 48 respondents who used 3-month injectable contraceptives, 23 respondents had used it for more than 5 years and as many as 29 respondents experienced amenorrheaBased on the information obtained from the respondents, there are several reasons for using injectable contraceptives, including because of the minimal and safe side effects, does not interfere with activities, the injection distance is relatively long, the price is cheap and does not interfere with breast milk

### The Relationship between 3-Month Injectable Contraception and Body Mass Index (BMI)

Based on the results of the chi square statistical test, the value of  $p=0.001 < \alpha=0.05$  was obtained. The results showed that most of the respondents used injectable contraceptives for 3 months > 1 year, which was 66 (71.0%) with 36 respondents (40.9%) of them being overweight with an  $OR$  value = 15.0 which means that they have a risk of gaining weight up to 15 times. According to (Nault, 2013), in his study it was stated that the use of injectable contraceptives that only contain progesterone can cause an increase of around 1-2 kg in the first year of use and an increase of 4-10 kg after the use of injectable contraceptives for 3-5

years. Based on research (Sims et al., 2020) there were 240 respondents who had normal weight categories, overweight, class I obesity, class II obesity, class III obesity, weight gain when using the Depo Medroxyprogesterone Acetate contraceptive (DMPA). Weight gain can be caused by the use of injectable contraceptives for 3 months for a long period of time so that progesterone increases LDL (insoluble fat) and decreases HDL (water-soluble fat) levels. LDL levels will be stored in the body if the food consumed contains a lot of fat. Fat accumulation can also cause weight gain and can also be affected by food consumption, age, degenerative diseases and activity (Mas'udah et al., 2021).

Based on research by the University of Texas Medical Branch, Medroxyprogesterone acetate (DMPA) contraception or 3-month injection, on average, can experience an increase in body fat of 3.4% and weight gain of up to 5.5 kg in a period of 3 years of use, so the use of 3-month injectable contraceptives has a risk of 2 times the occurrence of obesity compared to the use of other types of contraception (Kurniawati & Andrie, 2015). The results of the study (Anitasari1 & Iswar, 2018), showed that there was a difference in weight before and after using injectable birth control. The average body weight before using injectable birth control was 52.64 kg and after using injectable birth control the average body weight was 55.58 kg, with the lowest weight of the respondent being 40 kg and the highest of the respondent being 73 kg with a p value = 0.000  $< \alpha = 0.05$ . Research (Westhoff et al., 2007), found that there was an increase in body weight at the beginning of the first 3 months of use, which was 0.5 kg, after 6 months of use there was an increase of 1 kg and in the 12th month of use there was an increase of 1.7 kg. Based on the information obtained from the respondents, most of them have jobs as housewives by doing regular physical activities and spending a lot of time at home so that the hormones in the 3-month contraception cause an increase in appetite but there is no burning process in the body. Activities can be said to be enough if you do 30 minutes of diving physical exercise every day/at least 3-5 days per week (Kemenkes RI, 2014).

Another side effect of 3-month injectable contraception is excess weight due to fat accumulation so that it can cause an increase in heart work to be able to pump blood throughout the body so that it can cause an increase in blood pressure. In addition, excessive fat levels can be at risk of other degenerative diseases so it needs to be controlled as a prevention (Setyawati et al., 2017), Prevention of weight gain which is the impact of using 3-month birth control acceptors is by doing a balanced diet, limiting food consumption, exercising diligently and consulting health workers about the type of contraception that suits the condition of the body.

### **The Relationship between 3-Month Injectable Contraception and Amenorrhea**

Based on the results of the chi square statistical test, p-value=0.001  $< \alpha = 0.05$  was obtained. The results showed that most of the respondents used injectable contraception for 3 months > 1 year, which was 66 (71.0%) with 51 respondents (54.8%) experiencing amenorrhea with an OR value = 0.20, which means that there was a 0.20 chance of experiencing amenorrhea. This shows that there is an effect between the duration of 3-month contraceptive use and the incidence of amenorrhea. According to (Mutia & Kamsatun, 2017), the use of 3-month injectable contraceptives containing progestin hormones can affect FSH and LH hormones but does not have much effect, so that at the beginning of contraceptive use, the acceptor still experiences irregular menstrual periods and subsequently spotting, but the longer the use becomes non-menstruation/ amenorrhea. Research from (Kusuma, 2016), from the results of the chi square statistical test shows that there is a relationship between contraceptive methods (p=0.0098) and the duration of contraceptive use (p=0.012) with subjective health complaints,

hormonal contraceptive methods can increase the risk by 4.05 times and the duration of contraceptive use  $\leq 5$  years can increase 7.82 times to experience subjective health complaints, one of which is menstrual disorders.

Based on research (Kurniawati & Afifatul Latifah, 2022), it was found that the majority of respondents were 26-35 years old and more than 1 year using hormonal contraceptives (80.3%). The results of the cross-tabulation test were obtained as many as 71.8% of respondents experienced menstrual cycle disorders using 3-month injectable contraceptives. The long-term use of 3-month injectable contraceptives can cause vaginal dryness, decreased libido, emotional disturbances, acne and headaches, as well as menstrual disorders. At the beginning of use ( $< 1$  year) will experience irregular blood spots (spotting) or experience heavy bleeding but in  $> 1$  year of use begin to experience amenorrhea (Sinaga, 2021). The cause of spotting is suspected to be due to the addition of the hormone progesterone in the body so that which makes the venous blood vessels in the endometrium fragile due to the dilation of blood vessels, the fragility causes spotting bleeding (Munayarokh, Triwibowo & Rizkilillah, 2014).

Research from (K.A & Astuti, 2015), on the use of DMPA injectable contraceptives with as many as 55 respondents, it was found that as many as 29 people (52.7%) used DMPA contraceptives with a duration of  $> 2-3$  years, as many as 30 people (54.5%) experienced changes in the menstrual silices, so that there was a relationship between the length of use of DMPA injectable contraceptives and changes in the menstrual cycle ( $p$  value = 0.007). The cause of menstrual cycle disorders can occur due to changes in endometrial histology caused by hormonal imbalances. The results of the research (Alexander & Melyani, 2019), of the 34 injectable birth control acceptors, as many as 22 people (64.7%) with the duration of  $\geq 1$  year of birth control use were disturbed, so the results of data analysis obtained  $X^2$  hitung (8,503)  $> X^2$  table (3,841) which means that there is a relationship between the length of use of injectable contraception and menstrual disorders at the Siantan Health Center. Women who use birth control means that there are additional hormones in their body so that they affect fullness and affect the menstrual cycle, (Alfi & Anisah, 2021). However, not all injectable birth control acceptors experience disturbances from side effects.

## **CONCLUSION**

Based on the Chi Square analysis test, it was concluded that there is a relationship between the duration of 3-month use of injectable contraceptives and BMI, namely  $p$  value = 0.000, OR=15.00 meaning that it has a 15-fold risk of becoming overweight. The relationship between the duration of 3 months of injectable contraceptive use and amenorrhea with a  $p$  value = 0.000 and an ODD ratio of 0.20, meaning that it has a risk of 0.20 times of experiencing amenorrhea. The advice in this study is expected for acceptors to always communicate to health workers about the right contraceptive device to be used according to the acceptor's body condition.

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