

# https://doi.org/10.21608/zumj.2024.341850.3719 Manuscript ID ZUMJ-2412-3719 DOI 10.21608/zumj.2024.341850.3719

### ORIGINAL ARTICLE

**One-Year Pregnancy Rates after Discontinuation of Different Methods of Contraception** 

## Walid Mohamed Sayed Ahmed Elnagar, Mohammed Hassan Elsayed Barakat, Alshymaa Mostafa Attia Zaghlal, Amr Mostafa Abo Elfath

Obstetrics and Gynecology Department, Faculty of Medicine, Zagazig University

*Corresponding author:	ABSTRACT				
Alshymaa Mostafa Attia Zaghlal	Background: Determining the effect of contraceptive use on fertility				
	recovery after cessation is a significant concern for women using various				
Email:	forms of contraception. Therefore, our goal was to determine the pregnancy				
Familyplanning1988@gmail.com.	rate after stopping various kinds of contraception with the goal of becoming				
	pregnant before or at the 12th month.				
	Methods: This retrospective study was performed at Zagazig University				
	Hospital and Belbes Central Hospital on a total 3139 medical records of				
Submit Date 04-12-2024	women who conceived spontaneously after discontinuation of the				
Revise Date 19-12-2024	contraception method before or at 12 months with the intension to have				
Accept Date 21-12-2024	pregnancy.				
	Results: The duration of amenorrhea, time to pregnancy and the gap				
	between menstruation and pregnancy were significantly shorter in				
	intrauterine device (IUD) and implant with no significant differences				
	between them, followed by Progestogen-only pills (POPs) and combined				
	oral contraceptive (COCs) with no significant differences between them and				
	significantly longest in Depot medroxyprogesterone acetate (DMPA) and				
	Mesocept.				
	<b>Conclusion:</b> Contraceptive method significantly influenced the length time				
	to become pregnant after discontinuation of reversible contraceptive				
	methods (injectables, oral contraceptives, IUDs and implants). The impact				
	of duration of contraceptive use has no significant relationship to the time to				
	pregnancy following contraceptive discontinuation.				
	Keywords: Pregnancy Rates; Discontinuation; Contraception.				

#### **INTRODUCTION**

The modern world offers a wide variety of reversible modern contraceptives that are both safe and effective. The issue of women who use reversible contraception regarding the time it takes for their fertility to return has not been resolved, the development of contraceptive despite technology and concerted worldwide efforts over the past few decades. The majority of contraceptives have undergone modifications to increase their tolerability and safety without sacrificing their effectiveness [1]. Understanding how the use of contraception affects future fertility is equally crucial. However, there is still conflicting evidence about the resumption of pregnancy following the cessation of contraceptive use. One

major issue for women who use contraception is the delay in fertility following termination. It has been hypothesized that contraceptive choices cause a delayed return of fertility, especially for women who have ever experienced post-pill amenorrhea or failed to conceive within the anticipated date of fertility after terminating contraception [2].

By using highly efficient reversible contraception to control undesirable fertility, couples were able to have as many children as they want at the desired time. However, regardless of genuine desire, reproductive impairment or delay brought on by past contraceptive usage may result in unhappiness and decreased contraceptive use. Women who use hormonal contraception are very concerned about delayed or impaired fertility after stopping it, as 15% of couples experience infertility (failure to conceive within a year) [1]. The use of contraceptives is frequently associated with infertility or a delayed recovery of fertility in former users. Therefore, it is necessary to synthesize and test this premise that causes misconceptions among family planning users using the evidence that is now available worldwide [3].

Scholars have also expressed worries about the possibility that the use of oral contraceptives may result in secondary amenorrhea, which is linked to anovulation and decreased reproductive fecundity. Infertility due to pelvic inflammatory disease (PID) can also be brought on by IUDs [4]. Exogenous hormone therapy was thought to result in temporary infertility and a delayed recovery to normal hypothalamic, pituitary, and ovarian axis function. More recent research, however, has partially debunked these worries due to the introduction of low-dose hormonal contraception, PID prevention, and the application of scientific methodology [5].

Numerous studies and a small number of specialized evaluations have been carried out to evaluate the impact of various kinds of contraception on subsequent pregnancies. Contraception has been demonstrated in some trials to merely cause an initial (short) delay in conception for the first few months after stopping it, although the results were inconclusive [6]. However, recent research found no link between secondary amenorrhea and the usage of contraceptives, with the exception of greater oestrogen dosages. However, numerous studies have revealed no correlation between the type of intrauterine device and the length of usage and the fertility recoverv of [7]. Thus, the purpose of this study was to evaluate the impact of fertility return among married women following the cessation of various forms of contraception. To provide conclusive proof, fertility return is calculated as the pooled rate of fertility return within a year. in order to provide policymakers and other interested parties with compiled data to use while making decisions regarding the problem's potential.

#### **METHODS**

After ethical committee approval, this retrospective study was performed at Zagazig University Hospital and Belbes Central Hospital in the period from January 2022 till December 2022 on a total 3139 medical records of women who conceived spontaneously after discontinuation of the contraception method before or at 12 months with the intension to have pregnancy. The study was approved by ethical committee of Faculty of Medicine, Zagazig University (IRB number 10781-21-5-2023).

# Inclusion criteria:

• Age: 18-3<sup>£</sup> years.

• Any Parity

• Women who conceived spontaneously after discontinuation of the contraception.

• Women who received one method of those contraception (IUD, Implants, COCs, POPs, Injectables) after the previous delivery.

# Exclusion criteria:

• Using contraception during pregnancy.

• Women who used assisted reproductive techniques (ICSI, IUI) or inducement of ovulation to become pregnant.

• Women with a PID history.

• Women who have already experienced infertility.

• Obstetric issues (HELLPS, GDM, pre-eclampsia), medical conditions (autoimmune illnesses, diabetes mellitus, SLE), and a history of infection following a prior birth.

To determine the pregnancy rate, the research population's medical records from the prearranged period were first updated to reflect the diagnosis of pregnancy after stopping various kinds of contraception (IUDs, implants, COCs, POPs, and injectables). The gathered data was subsequently tallied, coded, and subjected to statistical analysis. When accessible, the following information was collected, collated, and then properly statistically analyzed:

Age, BMI, obstetric history (parity and delivery method), length of contraception, methods of contraception, menstrual history during contraception, medical conditions (hypertension, diabetes, SLE), surgical or obstetric issues (HELLPS, GDM, pre-eclampsia), and history of infection following a previous delivery are all included in the history.

**1.** A general, local examination to rule out vaginal bleeding when using contraception and to check vital signs (temperature, blood pressure, and pulse).

2. Examinations that include: CBC, liver and kidney functions, if available, abnormal uterine bleeding or pregnancy, basic obstetric ultrasound for IUD, and other tests to rule out any organ problems.

Outcome measures: 1ry outcome: • The percentage of pregnancies that occur after stopping contraception before or at 12 months with the goal of becoming pregnant.

# **2ry outcome:**

The relationship between the prior delivery method and the pregnancy rate.
The amount of time after using contraceptives to become fertile.

Postpartumamenorrhea

• Unusual menstruation.

## Statistical methods

IBM SPSS statistics (Statistical Package for Social Sciences) software version 28.0, IBM Corp., Chicago, USA, 2021, was used to code, tabulate, and statistically analyze the gathered data. Qualitative data is expressed as percentages and numbers. The ANOVA test (three independent groups) is used to compare quantitative data after it has been checked for normality using the Kolmogorov-Smirnov test and described as mean±SD (standard deviation) along with the lowest and maximum of the range. For post hoc comparisons, the Bonferroni test is employed. When the p-value was less than 0.050, it was considered significant; otherwise, it was considered non-significant.

#### RESULTS

Table (1) showed demographic characteristics among the studied cases. Mean±SD of Age, parity and duration of contraception was  $26.7\pm2.8$ ,  $2.1\pm0.3$ and  $2.9\pm0.7$  respectively. The methods of contraception. COCs was the most frequent (47.9%), followed by IUD (21.9%), then Implant (16.4%), DMPA (8.4%) and POPs (3.8%), while Mesocept was the least frequent (1.6%). Mean±SD of duration of amenorrhea, time until pregnancy and the gap between them were  $1.9\pm1.1$ ,  $3.8\pm2.0$  and  $1.8\pm1.3$  respectively.

Table (2) shows that: No statistical significant differences according to method of contraception

regarding age (years). Mean $\pm$ SD was 26.8 $\pm$ 2.7, 26.6 $\pm$ 2.8, 27.1 $\pm$ 2.8, 26.6 $\pm$ 2.8, 26.9 $\pm$ 3.0 and 27.1 $\pm$ 2.8 in IUD, Implant, POPs, COCs, DMPA and Mesocept respectively.

Table (3) shows that: No statistical significant differences according to method of contraception regarding parity. Mean $\pm$ SD was 2.0 $\pm$ 0.4, 2.1 $\pm$ 0.3, 2.1 $\pm$ 0.3, 2.1 $\pm$ 0.3, 2.1 $\pm$ 0.3 and 2.0 $\pm$ 0.4 in IUD, Implant, POPs, COCs, DMPA and Mesocept respectively.

Table (4) shows that: No statistical significant differences according to method of contraception regarding duration of use (years). Mean $\pm$ SD was 2.9 $\pm$ 0.7, 2.8 $\pm$ 0.7, 2.9 $\pm$ 0.7, 2.9 $\pm$ 0.7, 3.0 $\pm$ 0.7 and 3.0 $\pm$ 0.7 in IUD, Implant, POPs, COCs, DMPA and Mesocept respectively.

Table (5) shows that: Duration of amenorrhea (cycles) was shortest in IUD and Implant with no significant differences between them ( $1.0\pm0.1$  and  $1.1\pm0.3$  respectively), followed by POPs and COCs with no significant differences between them ( $2.2\pm0.7$  and  $2.1\pm0.4$  respectively) and significantly longest in DMPA and Mesocept ( $4.5\pm1.3$  and  $4.4\pm1.3$  respectively).

Table (6) shows that: Time to pregnancy (cycles) was shortest in IUD and Implant with no significant differences between them (2.2 $\pm$ 0.6 and 2.4 $\pm$ 0.8 respectively), followed by POPs and COCs with no significant differences between them (4.3 $\pm$ 1.4 and 4.0 $\pm$ 1.3 respectively) and significantly longest in DMPA and Mesocept (7.9 $\pm$ 2.5 and 7.5 $\pm$ 2.3 respectively).

Table (7) shows that: Gap between menstruation and pregnancy (cycles) was shortest in IUD and Implant with no significant differences between them  $(1.2\pm0.6 \text{ and } 1.3\pm0.7 \text{ respectively})$ , followed by POPs and COCs with no significant differences between them  $(2.1\pm1.3 \text{ and } 1.9\pm1.3 \text{ respectively})$  and significantly longest in DMPA and Mesocept  $(3.3\pm2.1 \text{ and } 3.1\pm2.3 \text{ respectively})$ .

**Table (1):** Baseline data among the studied cases (Total=3139).

Variables	Mean±SD	Range
Age (years)	26.7±2.8	18.0–34.0
Parity	2.1±0.3	1.0-3.0
Duration of contraception (months)	2.9±0.7	0.2–5.6
Duration of amenorrhea (cycles)	1.9±1.1	1.0-8.0
Time until pregnancy (cycles)	3.8±2.0	1.0-12.0
Gap between menstruation and pregnancy (cycles)	1.8±1.3	0.0-8.0

https://doi.org/10.21608/zumj.2024.341850.3719

Volume 31, Issue <sup>\*</sup>, FEB. 2025, Supplement Issue

Methods	n	%
IUD	686	21.9%
Implant	516	16.4%
POPs	118	3.8%
COCs	1505	47.9%
DMPA	263	8.4%
Mesocept	51	1.6%

**Table (2):** Comparison according to method of contraception regarding age (years)

Method	Mean±SD	Range	p-value
IUD	26.8±2.7	18.0–34.0	
Implant	26.6±2.8	18.0–34.0	
POPs	27.1±2.8	20.0-34.0	0.225
COCs	26.6±2.8	18.0–34.0	0.225
DMPA	26.9±3.0	20.0-34.0	
Mesocept	27.1±2.8	21.0-34.0	

ANOVA test.

Table (3): Comparison according to method of contraception regarding parity

Method	Mean±SD	Range	p-value
IUD	2.0±0.4	1.0-3.0	
Implant	2.1±0.3	1.0-3.0	
POPs	2.1±0.3	1.0-3.0	0.470
COCs	2.1±0.3	1.0-3.0	0.470
DMPA	2.1±0.3	1.0-3.0	
Mesocept	2.0±0.4	1.0-3.0	

ANOVA test.

Table (4): Comparison according to method of contraception regarding duration of use (years)

Method	Mean±SD	Range	p-value
IUD	2.9±0.7	0.2–5.6	
Implant	2.8±0.7	0.8–5.1	
POPs	2.9±0.7	1.2–4.4	0.112
COCs	2.9±0.7 0.3–5.1		0.115
DMPA	3.0±0.7	1.0-4.7	
Mesocept	3.0±0.7	1.2-4.1	

ANOVA test.

# https://doi.org/10.21608/zumj.2024.341850.3719

#### Volume 31, Issue <sup>Y</sup>, FEB. 2025, Supplement Issue

Table (5): Comparison according to method of contraception regarding duration of amenorrhea (cycles)

Method	Mean±SD	Range	p-value	HG
IUD	1.0±0.1	1.0–1.0	< 0.001*	a
Implant	1.1±0.3	1.0–2.0		a
POPs	2.2±0.7	1.0–5.0		b
COCs	2.1±0.4	1.0–5.0		b
DMPA	4.5±1.3	3.0-8.0		с
Mesocept	4.4±1.3	3.0–7.0		с

ANOVA test. \*Significant. HG: Homogenous groups had the same symbol "a,b,c" based on post hoc Bonferroni test.

**Table (6):** Comparison according to method of contraception regarding time to pregnancy (cycles)

Method	Mean±SD	Range	p-value	HG
IUD	2.2±0.6	1.0–5.0	<0.001*	a
Implant	2.4±0.8	1.0–5.0		a
POPs	4.3±1.4	2.0–7.0		b
COCs	4.0±1.3	1.0-8.0		b
DMPA	7.9±2.5	3.0–12.0		с
Mesocept	7.5±2.3	3.0–12.0		с

ANOVA test. \*Significant. HG: Homogenous groups had the same symbol "a,b,c" based on post hoc Bonferroni test.

Table (7): Comparison according to	o method of contraception	regarding gap between	menstruation and
pregnancy (cycles)			

Method	Mean±SD	Range	p-value	HG
IUD	1.2±0.6	0.0–4.0	<0.001*	a
Implant	1.3±0.7	0.0–4.0		a
POPs	2.1±1.3	0.0–5.0		b
COCs	1.9±1.3	0.0–6.0		b
DMPA	3.3±2.1	0.0-8.0		с
Mesocept	3.1±2.3	0.0–7.0		с

ANOVA test. \*Significant. HG: Homogenous groups had the same symbol "a,b,c" based on post hoc Bonferroni test.

### DISCUSSION

The majority of contraceptives have undergone modifications to increase their tolerability and safety without sacrificing their effectiveness. Understanding how the use of contraception affects future fertility is equally crucial. Nevertheless, there is now conflicting data on the resumption of pregnancy following the cessation of contraception. For women who use contraception, the delay in fertility following cessation of contraception is still a major worry [8].

Many women do not use modern contraception because they are afraid of negative effects, particularly those connected to resuming fertility after stopping contraception, such infertility. Thus, it is essential that all women receive thorough counseling [9].

Assessment of fertility return following reversible contraceptive discontinuation and evaluation of the associated factors among pregnant women was highlighted as a primary point of interest because delayed return to fertility following reversible contraceptive methods represents significant conflict and is frequently linked to confused couples [10].

In order to determine the pregnancy rate after stopping various forms of contraception (IUDs, implants, COCs, POPs, and injectables) with the intention of becoming pregnant before or at the 12th month, this study was carried out.

This retrospective study was carried out on 3139 women who conceived naturally after stopping the contraceptive method before or at 12 months with the intention of becoming pregnant at the tertiary care hospitals at Zagazig University Hospital and Belbes Central Hospital between January 2022 and December 2022.

3139 patients were included in the research after 3250 patients had their eligibility evaluated. According to the inclusion criteria, 111 patients out of all eligible patients were not allowed to participate in the study.

The data of 3139 women who conceived naturally after stopping the contraceptive technique before or at 12 months with the intention of becoming pregnant was the final source of the analysis.

A number of variables, including socioeconomic and demographic ones, were employed as controlled variables to affect when fertility returned following the cessation of reversible contraceptive use.

The average age, parity, and length of contraception were  $26.7\pm2.8$  years,  $2.1\pm0.3$ , and  $2.9\pm0.7$  months, respectively, according to the current study.

Regarding the methods of contraception, the most common method of birth control was COCs (47.9%), followed by IUDs (21.9%), Implants (16.4%), DMPA (8.4%), and POPs (3.8%). Mesocept was the least common method (1.6%), and there were no statistically significant differences based on age, parity, or length of contraceptive use by method of birth control (p values = 0.225, 0.470, and 0.113, respectively).

One of our study's strengths is that, as far as we are aware, there aren't many studies in the literature about fertility returning after stopping contraception.

These findings are in agreement with previous studies. Gayatri et al., [9] In order to analyze the time to pregnancy after discontinuing contraceptives among reproductive women, 3887 women who stopped using injectables, 1,641 women who stopped using oral contraceptives, 228 women who removed their IUDs, and 233 women who removed their implants for pregnancy planning were included in a secondary data analysis that was collected retrospectively. The results showed that 29% of respondents were between the ages of 35 and 49, and nearly 60% of respondents were between the ages of 25 and 34. In this study, injectables and oral contraceptives were more commonly used than IUDs and implants. Moreover, the likelihood of getting pregnant after stopping contraception is unaffected by the length of time spent using it. Because it has no effect on future fertility, women do not need to be afraid to use contraceptives for extended periods of time.

Damtie et al., [10] 172 (42.8%) of pregnant women used Depo-Provera, and 113 (28.1%) used implants as a method of contraception prior to the current pregnancy, according to a cross-sectional study that included 423 women to evaluate the fertility return following the cessation of hormonal contraceptives and related factors.

However, on the contrary, Damtie et al., [10] revealed that age has a significant association with delayed fertility return. The finding is similar to studies conducted by Farrow A et al, [11] and Barden-O'Fallon et al., [12].

A set amount of oocyte in the ovary may be the cause of this, as women's oocyte production declines with age. The other explanation might be that women are more susceptible to conditions like endometriosis and uterine fibroids, which can impair fertility, as they age. Furthermore, older women are more likely to have aberrant chromosomes in their remaining oocytes as they age [13].

Similarly, the age of women affects the resumption of fertility itself, according to Gayatri et al. [9]. This is due to the fact that fertility is strongly correlated with age, meaning that older women are less likely to conceive naturally [14–16], which is followed by stages of overt irregularity in the cycle. Decreases in anti-Mullerian hormone levels best reflect the slow reduction in the size of the antral follicle cohort. The wide range in menopausal age is indicative of the diversity in ovarian aging in women. It is therapeutically relevant to identify women with significantly reduced ovarian reserve for their age. In assisted reproductive technology (ART), ovarian reserve tests have shown themselves to be reasonably reliable in forecasting the response to ovarian stimulation. Additionally, it may occur in elderly women who went through the menopause or perimenopause and failed to conceive after stopping contraception [9, 17].

Additionally, Noronha et al. [7] recruited 123 multigravida women in a cross-sectional study to examine the impact of age, BMI, duration of use, and type of contraception on the return of fertility. The results showed no significant correlation between the length of time spent using contraceptives and the return of fertility following family planning (p-value = 0.964). The chance of getting pregnant after stopping contraception is unaffected by the length of time used. Because it won't have an impact on fertility in the future, women don't need to be frightened to use contraceptives for very long.

However, in contrast to our results, Noronha et al., [7] showed that the recovery of fertility following birth control was significantly correlated with age (p-value = 0.031). The restoration of fertility is correlated with the age of users since a woman's oocyte production and quality decline with age. Female fertility will start to decline at age 35 and then sharply decline at age 37.

The older age of the women who participated in the trials—60% were between the ages of 25 and 34, and 29% were between the ages of 35 and 49— could account for this disparity in the findings of these studies and may have an impact on the women's ovarian reserve. After stopping the contraceptive method, the average duration of amenorrhea was  $1.9\pm1.1$  cycles, the time until the next pregnancy was  $3.8\pm2.0$  cycles, and the interval between menstruation and pregnancy was  $1.8\pm1.3$  cycles, according to the current study.

Additionally, the findings of our study showed that the duration of amenorrhea, time to pregnancy, and the interval between menstruation and pregnancy were significantly shorter in IUD and Implant but did not differ significantly from one another. POPs and COCs did not differ significantly from one another, while DMPA and Mesocept had the longest duration (p value< 0.001).

In agreement with our results, Damtie et al., [10] revealed that pregnant women who had previously used Depo-Provera, an implant, IUCD, and OCP had a 75%, 99.1%, 100%, and 97.8% fertility return, respectively. Pregnant women who stopped

using hormonal contraceptives before to the current pregnancy saw a median time of fertility return of six months. Before the present pregnancy, the median time of fertility return for Depo-Provera, implant, IUCD, and OCP users was 9 months, 4 months, 6 months, and 2 months, respectively. Therefore, compared to women who used implant, IUCD, and OCP, pregnant women who took Depo-Provera prior to the current pregnancy had a 4.8fold higher chance of experiencing a reproductive delay following quitting, and the time to pregnancy was much shorter in OCP and implant.

Accordingly, Depo-Provera use was positively correlated with delayed fertility recovery, according to Damtie et al. [10]. According to a global family planning handbook for medical professionals, Depo-Provera delays the recovery of fertility. Additionally, the results align with research by Yland JJ et al. [18]. This may be because Depo-Provera can remain in the body longer than other birth control methods, which causes progestin to take a long time to be cleared from the serum and delays ovulation. Depo-Provera, on the other hand, promotes significant weight gain, which causes irregular menstrual periods and stops ovulation in women. Women cannot conceive once they cease ovulation, which postpones the return of fertility [10].

Our results are consistent with those of Noronha et al. [7], who found a substantial correlation (p value=0.001) between the form of contraception and the return of fertility. As a result, the form of contraception has a significant impact on the chance of becoming pregnant. Compared to implants and injections, the rate of return to fertility following the cessation of oral contraceptives and IUDs was lower.

To restore fertility after stopping oral contraceptives, the bioavailability of the medication in the blood must be entirely eliminated. The use of high dosages of oral contraceptive formulations is linked to decreased fertility on the one hand. Therefore, as low dose contraception regimens are more common these days, it can be concluded that using oral contraceptives can help one return to fertility more rapidly [8, 19].

In line with our findings, Gayatri et al. [9] found that the types of contraceptive methods had a substantial impact on the likelihood of becoming pregnant. As a result, it is known that oral contraceptives and IUDs have a quicker time to conception than injectables and implants. Nonetheless, the conception rates across the four contraceptive methods were almost same after two years of cessation. Women who stopped using injectables had the longest delay in becoming pregnant.

According to our findings, a policy should be in place to reassure men and women of reproductive age that using reversible contraceptives does not increase fertility and that fertility returns after stopping them, though it may take some time depending on the type of reversible contraceptive used. Using reversible contraception would alleviate any concerns women (and their partners) may have over fertility loss. To satisfy their needs for contraception to space out pregnancies and to lower the likelihood of unintended births, this strategy must be complemented by a policy of greater promotion of reversible contraceptives among couples of reproductive age [8, 19].

# CONCLUSIONS

Knowledge regarding fertility return is essential for making educated decisions about contraceptives and for evaluating the level of care provided by reversible modern contraceptive methods. The current study makes clear that the type of contraception had a substantial impact on the amount of time it took to become pregnant after stopping reversible contraceptive methods (oral contraceptives, injectables, IUDs, and implants). There is no substantial correlation between the length of time spent using contraceptives and the time it takes to become pregnant after stopping them. To dispel their misconceptions regarding their incapacity to conceive after stopping the use of reversible contraceptives, couples should be informed about the resumption of fertility. Health care professionals should counsel married women who wish to select a method of birth control. In order to assist women to choose the appropriate method of contraception for their family size goals, this counseling procedure is essential.

# **Financial Disclosures**

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

# **Conflict of interest**

The authors declare that they have no conflicts of interest with respect to authorship or publication of this article.

# REFERENCES

1. Vaughan B, Trussell J, Kost K, Singh S, Jones R. Discontinuation and resumption of contraceptive

use: results from the 2002 National Survey of Family Growth. Contraception. 2008 Oct 1;78(4):271-83.

- Girum T, Wasie A. Return of fertility after discontinuation of contraception: a systematic review and meta-analysis. Contracept. Reprod. Med. 2018 Dec; 3:1-9.
- Bellizzi S, Mannava P, Nagai M, Sobel HL. Reasons for discontinuation of contraception among women with a current unintended pregnancy in 36 low and middle-income countries. Contraception. 2020 Jan 1;101(1):26-33.
- 4. Barnhart KT, Schreiber CA. Return to fertility following discontinuation of oral contraceptives. Fertil Steril. 2009 Mar 1;91(3):659-63.
- Steenland MW, Zapata LB, Brahmi D, Marchbanks PA, Curtis KM. The effect of follow-up visits or contacts after contraceptive initiation on method continuation and correct use. Contraception. 2013 May 1;87(5):625-30.
- 6. Mansour D, Gemzell-Danielsson K, Inki P, Jensen JT. Fertility after discontinuation of contraception: a comprehensive review of the literature. Contraception. 2011 Nov 1;84(5):465-77.
- Noronha QM, Nurinasari H, Budihastuti UR. Return of Fertility After Discontinuation of Contraception According Type of Contraception, Duration of Use, Age and BMI. Indones. J. Obstet. Gynecol. 2022 Jan 28:37-41.
- Girum T, Wasie A. Correction: Return of fertility after discontinuation of contraception: a systematic review and meta-analysis. Contracept. Reprod. Med. 2023 Apr 21;8(1):29.
- Gayatri M, Utomo B, Budiharsana M. How soon can you expect to get pregnant after discontinuing reversible contraceptive method? A survival analysis of the 2017 Indonesia demographic and health survey data. Indian J Public Health Res Dev. 2020 Jan 31;11(1):310-4.
- Damtie Y, Kefale B, Arefaynie M, Yalew M, Adane B. Fertility return after hormonal contraceptive discontinuation and associated factors among women attended Family Guidance Association of Ethiopia Dessie model clinic, Northeast Ethiopia: A cross-sectional study. PLoS One. 2023 Jul 11;18(7):e0287440.
- Farrow A, Hull MG, Northstone K, Taylor H, Ford WC, Golding J. Prolonged use of oral contraception before a planned pregnancy is associated with a decreased risk of delayed conception. Hum. Reprod. 2002 Oct 1;17(10):2754-61.
- 12. Barden-O'Fallon J, Speizer IS, Calhoun LM, Moumouni NA. Return to pregnancy after

contraceptive discontinuation to become pregnant: a pooled analysis of West and East African populations. Reprod. Health. 2021 Dec; 18:1-0.

- 13. Capezzuoli T, Vannuccini S, Fantappiè G, Orlandi G, Rizzello F, Coccia ME, et al. Ultrasound findings in infertile women with endometriosis: evidence of concomitant uterine disorders. Gynaecol. Endocrinol. 2020 Sep 1;36(9):808-12.
- Broekmans FJ, Soules MR, Fauser BC. Ovarian Aging: Mechanisms and Clinical Consequences. Endocr Rev. 2009;30(5):465–93.
- Homan GF, Davies M, Norman R. The impact of lifestyle factors on reproductive performance in the general population and those undergoing infertility treatment: A review. Hum Reprod Update. 2007;13(3):209–23.

- 16. Williams CJ, Erickson GF. Morphology and Physiology of the Ovary. Endotext. MD Text.com, Inc.; 2000.
- 17. Glasier A. Implantable contraceptives for women: effectiveness, discontinuation rates, return of fertility, and outcome of pregnancies. Contraception. 2002;65(1):29–37.
- 18. Yland JJ, Bresnick KA, Hatch EE, Wesselink AK, Mikkelsen EM, Rothman KJ, et al. Pregravid contraceptive use and fecundability: prospective cohort study. bmj 2020, 371.
- Landersoe SK, Birch Petersen K, Sørensen AL, Larsen EC, Martinussen T, Lunding SA, et al. Ovarian reserve markers after discontinuing longterm use of combined oral contraceptives. Reprod Biomed Online. 2020;40(1):176–86.

# Citation

Elnagar, W., Barakat, M., Zaghlal, A., Abo Elfath, A. One Year Pregnancy Rates after Discontinuation of Different Methods of Contraception. *Zagazig University Medical Journal*, 2025; (592-600): -. doi: 10.21608/zumj.2024.341850.3719