*Health Education and Health Promotion (HEHP) (2015) Vol. 3 (2)*

# Influence of Condom and Contraceptive Pills on Weight Gain among Some Algerian Female Athletes

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**Abstract**

**Aim**: This study focuses on the impact of contraceptive methods on weight gain among female athletes. Clinical studies confirm that weight gain is often considered a side effect of hormonal contraceptives and many women think that an association exists; this is while, Sports Medicine and Injuries' Studies report that this effect is still unclear. This comparative study was designed to dwell on the results of similar studies.

**Method:** Two groups of voluntary female athletes agreed to participate in this study. They were distributed based on the conditions proposed for this study (Group 1 took the oral contraceptive, and Group 2 practised condom) for three cycles of the ovum of the same marital lifestyle. Then they were tested based on the U.S. Federal Government's Standard Fitness Tests for Women, and their homogeneity was calculated on the basis of age (training and chronology), the typical training program, and social condition.

**Findings:** Based on the research findings:
• The proposed techniques prevent pregnancy record in regulating the samples' menstruation cycle during the experiment.
• *Practising* condom preserves the body weight index composition with a positive physical potential.
• Taking oral contraceptive increases the body fat with negative physical potential.
• There is a strong positive relationship between the body fat and the level of body fitness in the benefit of condom.

**Conclusion:** Our results are in line with the findings from similar clinical and sport medicine studies, confirming that the use of oral contraceptives increases the percentage of body fat and decreases aerobic fitness among female athletes.

**Keywords:** Weight gain, Fitness, Conjugal life, Female athletes

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## Introduction

Enjoying cross-cultural use worldwide, male condoms are the fourth most popular contraceptive method with 10% of the couples reporting relying on this method [1-4]. While Bruce D. Wingerd (2013) indicates that the most popular contraceptive method worldwide is the use of male condom [5], and Janell L. Carroll (2015) informs that there are a growing number of women looking for non-hormonal alternatives for preventing pregnancy [6]. Hilary M. Lips (2016) reported that among younger women, the pill was the most commonly used method of contraception: 22.4% of women aged 15 to 24 years were using the contraceptive pills as a more widely used method [7], while according to R. Cliquet et al. (2012), worker women prefer to start using the modern contraceptives earlier in their married life than the non-working married women [8]. This trend makes the pill contraceptive method continuously popular because of its convenience, low cost, and reversibility [9]. Today, 60 million women use birth control pills as confirmed by Rachel Snow et al. (2012) [10] to the extent that pill has become one of the most widely prescribed drugs in the history due to the hormones, which prevent a woman to produce a mature egg [11].

Vinay Kumar (2012) [12] suggests that birth control pills may cause good or bad side effects. Warholm L, et al. (2012) [13] believe that there are no indications of a negative impact of contraceptive pills on weight, body composition or height, while Michele Kettles et al. (2006) confirm the effects of oral contraceptives on weight, body composition, and fat distribution in young women [14].

Regarding the sports studies, Thomas E. Hyde et al. [15] disseminated that the effect of oral contraceptives on athletic performance is not yet clear. In agreement, Marc Safran [16] confirms that oral contraceptives have no adverse effects on the body change and performance but Michael Brunet (2009) denies that increase in fat mass due to oral contraceptives might have unfavourable effects on athletic performance in individual women [17]. Whereas, according to the findings of some other studies, there is little evidence that athletic performance is reduced [18].

Due to divergent views on the side effects of oral contraceptives on weight gain [19]; the aim of this study is to determine the effect of the proposed method on body fat and athletic performance.

## Methods

This experimental correlation study was conducted on some Iranian female athletes based on the U.S. Federal Government' Fitness Standards Tests for Women (2015) [20] for three cycles on their ovum.



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For this purpose, our protocol was focused on:

**Random variables**

- The same marital lifestyle education and social status
- Be in good health, and able to give birth
- Experience variables:
- Amateur sport, the same category and competitive level
- The same coach and training program (3 days a weeks for 1h and 30min)
- *Group 1 pill *, and Group 2 condom users.

**Table 1:** Fitness category (age 20-29 years) [20]

| Fitness tests | % Body fat | Sit and reach | Push-ups | Sit-Ups | 1.5 Mile run |
|---|---|---|---|---|---|
| Superior | <10.9 | >24.4 | +25 | >50 | <10:48 |
| Excellent | 10.9-17.1 | 22.5-24.4 | >24 | 44-50 | 10:48-12:51 |
| Good | 17.2-20.6 | 20.5-22.4 | 20-24 | 38-43 | 12:52-14:24 |
| Fair | 20.7-23.7 | 19.3-20.4 | 14-19 | 32-37 | 14:25-15:26 |
| Minimum | 22.1 | 18.3-19.2 | 16 | 35 | 14:55 |
| Poor | 23.8-27.7 | 17.0-18.2 | 9-13 | 27-31 | 15:27-16:33 |
| Very poor | >27.7 | <17.0 | <9 | <27 | >16:33 |

**Subjects**

The subjects were 16 voluntarily participated female Judokas amateurs, newly married, active in the Women's Association of Sidi Bel Abbes, and average age 21±5 years. Their homogeneity was calculated based on their performance, and the results of Independent Samples' T-test showed no significant difference between the pre- and post-tests (Table 2).

**Table 2:** Results of Independent Samples' T-test between the pre- and post-tests

| Test | | Pre-test | | | | Post-test | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Group 1 | Group 2 | T | Sig. | Group 1 | Group 2 | T | Sig. |
| % Body fat | Mean ± SD | 18.75±1.36 | 18.93±1.21 | -.29 | .78 | 19.39±1.22 | 18.99±0.97 | .70 | .49 |
| Sit and reach | Mean ± SD | 17.51±0.92 | 17.55±0.71 | -.07 | .95 | 17.06±0.95 | 18.39±0.71 | -3.19 | .00 |
| Push-ups | Mean ± SD | 12±1.31 | 11.88±1.36 | .19 | .86 | 10.75±1.17 | 12.75±1.28 | -3.27 | .00 |
| Sit-ups | Mean ± SD | 43.50±1.19 | 43.62±0.96 | -.24 | .82 | 40.63±1.69 | 44.50±1.19 | -5.31 | .00 |
| 1 Mile run | Mean ± SD | 11.48±0.51 | 11.53±0.57 | -.27 | .83 | 12.00±0.41 | 11.30±0.51 | 2.99 | .01 |

**Data analysis**

All calculations were carried out using the SPSS software (ver. 20) [21]. According to the goals of the research, our statistical study was based on the computations made by Independent T-test, Paired Samples T-test students and



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correlation Paired Samples Test to compare the obtained results between the study groups and between different contraceptive methods, as well as the correlation between the variables. P-value≤0.05 was considered to be statistically significant.

## Results

None of the inter-group comparisons by Independent Samples-T in the pre-tests (Table 2) were significant at p ≤0.05. In contrast, the post-test results were all significant except in %Body Fat; this is in agreement with the judgment of Warholm L, et al. (2012) [13] and Sondheimer SJ (1991) [22], suggesting that modern oral contraceptive pills are safe and show minimal metabolic effects. Furthermore, this is consistent with the judgment of similar other studies, confirming that the effects of oral contraceptives consist of small changes in the body weight and the body composition of female athletes. All the comparisons made by Paired Samples T test in Table 3 were confirmed by the Independent Samples T test results regarding the increase of body fat and the decrease of physical fitness in the case group.

Our results are also consistent with the judgment of Lopez LM, et al. (2013) [23] and Chebet JJ, et al. (2015) [24], who reported the side effects of oral contraceptives as weight gain and fatigue.

**Table 3:** Inter-group comparisons between the chosen variables

| Test | Pill | T | Sig. | R | Sig. | Condom | T | Sig. | R | Sig. |
|---|---|---|---|---|---|---|---|---|---|---|
| %Body fat | Group 1 t1 & Group 1 t2 | -10.15 | .78 | .99 | .00 | Group 2 t1 & Group 2 t2 | -.46 | .66 | .98 | .00 |
| Sit and reach | Group 1 t1 & Group 1 t2 | 4.17 | .95 | .97 | .00 | Group 2 t1 & Group 2 t2 | -3.19 | .00 | .95 | .00 |
| Push-ups | Group 1 t1 & Group 1 t2 | 3.99 | .86 | .75 | .03 | Group 2 t1 & Group 2 t2 | -3.27 | .00 | .80 | .02 |
| Sit-ups | Group 1 t1 & Group1 t2 | 8.21 | .82 | .82 | .01 | Group 1 t1 & Group 2 t2 | -5.31 | .00 | .72 | .04 |
| 1.5 Mile run | Group 1 t1 & Group 1 t2 | -5.09 | .83 | .82 | .01 | Group 2 t1 & Group 2 t2 | 2.99 | .01 | .95 | .00 |

According to the data given in Table 3, we can say that:

•Practicing condom preserves the composition of body weight with a positive physical potential;

•Taking oral contraceptive pills causes body fat with negative physical potential; and

•There is a strong positive relationship



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between body fat and level of body fitness in the benefit of the condom.

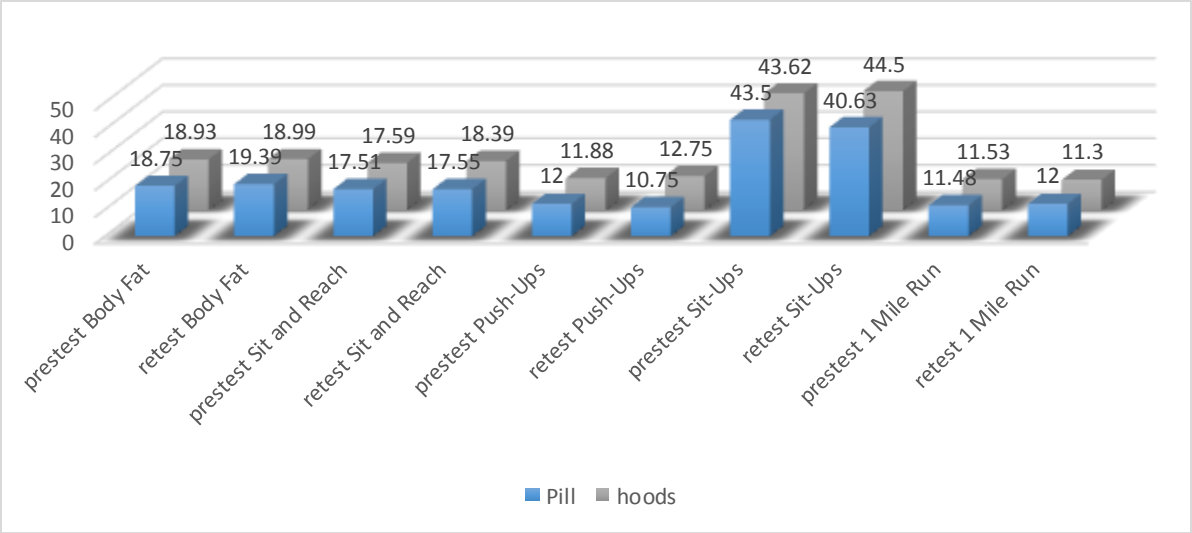



**Figure 1:** Comparison of the fitness results on pre- and re-tests.

## Discussion

Our results agree with the conflict set by Dagny Scott, et al. (2000) [25] on birth control pills' side effects. Researchers disagree about the impact of birth control pills on athletic performance. Dagny Scott Barrios (2007) [26], Holy Grigg-Spall (2013) [6], Joy McCarthy (2014) [27] and Tami Meraglia (2015) [28] confirm that the same hormones, which prevent pregnancy, can affect the women's body functions, which has also been confirmed by Reubinoff BE, et al. [29].

Our results support the findings of Lopez LM et al. (2013) [23] and Chebet JJ et al. (2015) [24] that the two main side effects of the oral contraceptives include weight gain and fatigue.

- In the case of % Body Fat, we confirm that the oral contraceptives increase the body fat. This result is consistent with the report of Barbara L. Drinkwater (2008) [30] that muscle strength is directly related to the development of muscle mass compared to the loss of the fat mass.
- For the Sit and Reach test as measure of the flexibility [31] of the lower-body [32], our results confirm that there is a strong positive correlation between contraception methods and body fitness. Our results are also in line with the confirmation that reduction in body strength and endurance decreases flexibility [33]. Also training has a direct and positive relation to physical health of female athletes [34].
- For Push-up tests as a measure of health quality, our results confirm that there is a



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strong positive correlation between contraception methods and body fitness. Our results are consistent with the findings of Griffin John (2014) [35] that the distribution of body weight affects the results of sit-up tests in lower body.

- For Sit-up tests as a measure of the muscular endurance of the abdominal muscles [36], our results are consistent with the judgment by Cissik, John, Dawes, Jay (2016) [37] that the overweight athletes spend more energy because they have to move a greater mass [27, 28]; this brings about fatigue in them, which in turn will negatively affect their performance [38].
- For 1 Mile run test as an endurance physical quality, Heyward, Vivian H. et al. (2014) [39] believe that the test is a valid predictor of VO2max and is a reliable alternative fitness test. Our results are consistent with the judgment of Neil Armstrong et al. (2008) [40] that the effect on $VO_2$max expressed per kilogram of body weight is less than 40% of individual differences, and it is less than 25% when $VO_2$max is expressed relative to the fat-free mass [41].

In line with the findings of Philip Maffetone, (2012) [42], our results imply that these medications have potential side effects, which can impact health, muscles, metabolism, and other systems of the body that promote health and fitness. According to Jane Kelly Kosek et al. (2000) [43], after a few months of taking the pills, the exercise activity is affected negatively. Based on our experience on this topic, we agreed on the judgment of William J. et al. (2011) [44] that the use of oral contraceptives has become increasingly popular among female athletes, which has led to the increased percentage of body fat and decrements in aerobic fitness. We suggest that the contraceptive methods have different efficacies, potential side effects, and risks, while Rickenlund A, et al. (2004) believe that it cannot be denied that a marked increase in fat mass might have unfavourable effects on athletic performance in individual women [45].

## Conclusions

According to the results of the present study and the evidence based on similar studies, it is concluded that female athletes taking contraceptive pills must:

- Control their weight daily;
- Condom is the most appropriate method to maintain physical form in women athletes; and
- Side effects are more dependent on the lifestyle choices by the woman and her partner.

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