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# Effect of yoga boat pose on weight loss in 3-month injectable contraceptive receptors

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**ABSTRACT**

Weight gain in injectable contraceptive acceptors is one of the most common side effects. Long-term weight gain can lead to obesity. One of the complementary therapies that can be done by injectable contraceptive acceptors to lose weight is to do yoga boat pose. Of the 674 acceptors who used 3-month injectable contraceptives at Hadimulyo Health Center there were 75 people who experienced excessive weight gain. The yoga boat pose was given to 75 acceptors. Body mass index measurements were taken before and after the implementation of yoga. The instruments used were a weight measuring device, a height measuring device and an observation sheet for the implementation of yoga boat pose. Data analysis was carried out with the Wilcoxon Test. The results of BMI measurements before treatment showed that most samples had BMI in the obese category (74.67%) with an average BMI of 24.80 and an average body weight of 60.05 kg, while after treatment showed a decrease in the number of obese categories to (73.33%) with an average BMI of 24.55 and an average body weight of 59.41 kg. There is an effect of Yoga Boat Pose on the weight of 3-Month Injectable Contraceptive Receptors in the Hadimulyo Health Center Work Area, Mesuji Regency Lampung (p = 0.001). Yoga Boat Pose can be applied as a complementary therapy for weight loss in 3-month injectable contraceptive acceptors who experience excessive weight gain.

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# INTRODUCTION

Family planning is a government program that aims to control the growth of the population by making contraceptive methods available to couples of childbearing age. One commonly used contraceptive method is hormonal injections, such as the 3-month injectable contraceptive. Although effective in preventing pregnancy, some users of 3-month injectable contraceptives experience weight gain as a side effect that may be undesirable (Dhio & Cahyaningrum, 2021).

Weight gain is the most common adverse effect reported by users of the 3-month injectable contraceptive. A study by Zerihun (2021) found that women who used injectable contraceptives

experienced an average weight gain of 3.4% over three years of use. This contraceptive-induced weight gain is due to an increase in adipose tissue mass (Zerihun et al., 2021). Results from a Royal College of Obstetricians and Gynaecologists prospective cohort study in Edinburgh found that over 5% of progestin injectable contraceptive users experienced weight gain after 6 months of use, which increased with duration of use (FSRH, 2019).

Results from a study conducted in Semarang showed that the majority of users who used the three-month injectable contraceptive for less than a year experienced weight gain (89.2%), while those who used it for more than a year experienced weight gain (95.9%) (Dhio & Cahyaningrum, 2021). A study in Bandar Lampung showed an increase in body weight of 3.70 kg among 3-month injectable contraceptive users, with a minimum weight gain of 0.00 kg and a maximum of 9.00 kg (Fenniokha et al., 2022).

The effect of uncontrolled long-term weight gain is the emergence of obesity problems in 3-month injectable contraceptive acceptors. Obesity is an excessive accumulation of fat due to a long-term imbalance between energy intake and energy expenditure. Obesity is closely related to the incidence of non-communicable diseases, the risk of developing diabetes (44%), ischemic heart disease (23%) and cancer (7%-41%) (RI, 2018).

In relation to the many complaints of weight gain among users of the three-month injectable contraceptive, many mothers make various efforts to maintain their weight, whether through dieting or physical activity. One of the complementary therapies that can be used to maintain weight is yoga practice. Yoga practice is a type of exercise that aims to improve the health and well-being of the body by incorporating physical activity, breathing exercises, relaxation techniques, and meditation exercises (Lestari et al., 2017).

Yoga exercises consist of many types and several types of movements. Some movements that are often associated with weight loss efforts include boat pose, warrior II pose, lion pose, dolphin pose, cobra pose, garland pose, plank pose, eagle pose and many more. Among the various moves, boat pose is considered to be the most appropriate move to do for weight loss and elimination of belly fat (Tsopanidou et al., 2020). Boat pose is one of the yoga poses that effectively helps reduce belly fat, strengthen core muscles and improve digestion. If done correctly, this yoga pose can eliminate fat and tone the abdominal muscles. Boat pose can also strengthen the spine and improve the performance of important organs in the body, such as the kidneys and intestines (Fatimah et al., 2018). The basis of some of these benefits is what makes this movement used to lose weight in 3-month injectable contraceptive acceptors.

In several previous studies, yoga movements have been proven to be one of the most effective ways to lose weight. A study by Hidayati in 2015 showed interesting results, where out of 15 participants studied, 14 of them experienced significant weight loss. The decrease was measured through abdominal circumference and the average decrease reached 1.4 cm. This result shows the positive effect of yoga practice on overcoming obesity (Hidayati, 2015). Another study conducted by Fatimah et al. in 2018 also supports the previous findings. The group that did yoga showed significant weight loss compared to the control group. The average weight loss in the yoga group was about 0.81 ± 1.29 kg, which indicates that yoga movements can help reduce weight effectively (Fatimah et al., 2018).

Data on the number of injectable contraceptive acceptors were obtained as many as 743 acceptors, of which 674 (90.7%) were 3-month injectable contraceptives and the rest were 1-month injectable contraceptives, as a result of a pre-survey conducted in Hadimulyo Health Center, Mesuji Regency. After interviewing 10 acceptors of 3-month injectable contraceptives, the results showed that 9 (90%) mothers experienced weight gain and 1 person did not experience weight gain after using 3-month injectable contraceptives for 6 months to 1 year, with weight gain ranging from 3 to 5 kg. In the follow-up interviews related to the efforts made to lose weight, 3 of them tried to lose weight by drinking herbal medicine, while the other 6 said that they did not make any efforts, and all mothers (100%) did not know about yoga exercises to lose weight. Based on the

phenomenon related to the amount of weight gain in 3-month injectable contraceptive acceptors and the benefits of yoga practice, especially the boat pose movement on weight loss, as well as not many studies specializing in the yoga boat pose movement, the authors are interested in conducting research on: the effect of yoga boat pose on weight loss in 3-month injectable contraceptive acceptors at Hadimulyo Health Center, Mesuji Regency.

# RESEARCH METHOD

A pre-experimental design with a one-group pretest-posttest design was used in this study. This study was conducted in Hadimulyo health center, Mesuji regency, Lampung regency in May 2023. The population in this study were all acceptors of 3-month injectable contraceptives with a total of 674 acceptors. Non-probability sampling with purposive sampling technique with a total sample of 75 respondents was used in this study.

The instrument used to measure body weight is the GEA ZT-120 SMIC brand digital weight scale, and for height is the Seca 217 stadiometer, regularly calibrated at the Hadimulyo Health Center, while for the implementation of yoga boat poses using observation sheets and interviews, and the tools provided were yoga mats.

Data collection implementation begins with measuring weight and height of injectable contraceptive acceptors 3 months before implementing yoga boat pose. Then, the yoga boat poses were practiced for 8 sessions, twice a week, 3 days apart, and the length of yoga time in each session was 30 minutes. The second weight and height data collection was conducted after the respondent performed the yoga boat pose 8 times, using the same tools as the first measurement.

Data analysis techniques used were univariate and bivariate analysis. Univariate analysis in the form of body mass index measurement results before and after yoga boat pose. The results of the Kolmogorv-Smirnov test for data normality showed a p-value = <0.001. Thus, it can be concluded that the IMT data of the respondents are not normally distributed and therefore do not meet the requirements for the T-test, and as an alternative, a non-parametric test is performed with the Wilcoxon Signed Ranks Test.

# RESULTS AND DISCUSSIONS

BMI of respondents before doing yoga boat pose exercise

**Table 1.** BMI distribution before doing the yoga boat pose exercise

| Body Mass Index | *f* | Percentage |
|---|---|---|
| Overweight (23 - 24.9) | 56 | 74,67% |
| Obesity I (25 - 29.9) | 18 | 24% |
| Obesity II (> 30) | 1 | 1,33% |
| Total | 75 | 100 |
| Mean body weight | 60,05 | |
| Mean BMI | 24,80 | |

Results of BMI measurement before yogaboat pose exercise showed that most of respondents were in obese category (56=74.67 %), obese I category (18=24 %) and obese II category (1=1.33 %), mean BMI was 24.80 and mean body weight was 60,05 kilograms.

BMI of respondents after doing the Yoga Boat Pose exercise

**Table 2.** BMI distribution after doing the yoga boat pose exercise

| Body Mass Index | *f* | Percentage |
|---|---|---|
| Normal (> 18,5 – 22,9) | 2 | 2,67% |
| Overweight (23 - 24.9) | 55 | 73,33% |
| Obesity I (25 - 29.9) | 17 | 22,67% |
| Obesity II (> 30) | 1 | 1,33% |

| | | |
|---|---|---|
| Total | 75 | 100 |
| Mean body weight | 59,41 | |
| Mean BMI | 24,55 | |

Results of BMI measurement after yogaboat pose exercise showed 2 persons in normal category or 2.67 %, 55 persons in obese category or 73.33 %, 17 persons in obese I category or 22.67 %, and one person in obese II category or 1.33 %, mean BMI was 24.55 and mean body weight was 59.41 kilograms.

The effect of Yoga Boat Pose on weight loss

**Table 3.** Test results of the effect of yoga boat pose on weight loss

| Ranks | | N | Mean Rank | Sum of Ranks | Z | Asymp. Sig |
|---|---|---|---|---|---|---|
| Body Mass Index | Negative Ranks | 49[a] | 29,49 | 1445,00 | -5,409 | <0,001 |
| | Positive Ranks | 8[b] | 26,00 | 208,00 | | |
| | Ties | 18 | | | | |
| | Total | 75 | | | | |

According to the results of the Wilcoxon signed rank test in Table 3, out of the entire research sample, 49 persons (65.33 %) experienced weight loss after practicing the pose, 18 persons (24 %) experienced weight maintenance, and eight persons (10.67 %) experienced weight increase after practicing the pose. The results of analysis using the Wilcoxon test showed the value of Z-count -5.409> Z-table -1.645 with a p-value = <0.001 < α, so it can be concluded that there is an effect of Yoga Boat Pose on weight loss of 3-month injectable contraceptive acceptors in Hadimulyo Health Center Working Area, Mesuji Regency, Lampung Province in 2023.

**IMT of 3-month injectable contraceptive acceptors before Yoga Boat Pose**

The BMI of 3-month contraceptive acceptors before the Yoga Boat Pose exercise mostly had BMI in the obese category as many as 56 people (74.67%) with an average weight of 60.05 kg.

This is in accordance with research from Shiferaw (2021) which shows that the mean body mass index is significantly higher in DMPA users than non-users (Shiferaw et al., 2021). Similarly, research by Anitasari (2018) showed that the average body weight before using injectable contraceptives was 52.64 kg and after using had an average body weight of 55.58 kg (Anitasari & Iswar, 2018). The physiology of weight gain in 3-month injectable contraceptive users is not fully understood, but several mechanisms that may contribute include: water retention, metabolic changes and changes in appetite (Lopez et al., 2016).

The progestin hormone in the injections can cause increased water retention in the body. This can lead to feelings of bloating and temporary weight gain. The use of progestin injectable contraceptives can affect the body's metabolism. Some studies have shown that progestin hormones can slow the basal metabolic rate, which is the number of calories the body burns at rest. If calorie intake remains the same, the decrease in basal metabolic rate can lead to calorie overload and eventual weight gain (Shiferaw et al., 2021). Progestin hormones can also affect appetite. Some people report an increase in appetite when using 3-month injectable contraceptives. If caloric intake increases without compensatory exercise or physical activity, then weight gain can occur (Lopez et al., 2016).

In addition to physiological factors, there are other factors that can affect weight gain in 3-month injectable contraceptive acceptors, including initial body weight, race, or parity. Predictive risk factors for substantial weight gain in DMPA users remain difficult to identify and are inconsistent among studies. Some previous studies reported that differences in excessive weight gain were dependent on race and ethnicity, being more common in black populations than whites, Hispanics, and Asians (Bonny et al., 2004; Mangan et al., 2002). Several studies reported an increased risk of excessive weight gain on DMPA use that was associated with baseline BMI or

baseline overweight (Le et al., 2009; Vickery et al., 2013). Some studies found an increase in weight gain during DMPA, which was associated with parity (Jirakittidul et al., 2019).

The potential for excessive weight gain with DMPA use may occur in some women. Excessive weight gain is an important side effect among DMPA users that may hinder contraceptive initiation and continuation. Therefore, it is important to properly counsel women about the possible side effects of weight gain by encouraging them to continue physical activity and exercise and to maintain a balanced nutritional diet.

**Effect of Yoga Boat Pose on weight loss of 3-month injectable contraceptive acceptors**

Based on the results of data analysis, it is known that the BMI after the Yoga Boat Pose exercise shows a difference in BMI and weight values. Respondents who experienced weight loss were 49 people (65.33%), with BMI in the obese category to 55 people (73.33%), there were 2 acceptors who had normal BMI (2.67%), with a decrease in the average value to BMI 24.55 and the average weight to 59.41 kg. There is an effect of Yoga Boat Pose on weight loss of 3-month injectable contraceptive acceptors in the Hadimulyo Health Center Working Area, Mesuji Regency, Lampung Province.

These results indicate that the practice of Yoga Boat Pose can reduce weight, this has conformity with the theory of the benefits of doing yoga to increase the body's metabolism. Including the ability to burn calories. Gradually it will form changes in body shape and even weight loss by doing yoga regularly (Batrakoulis, 2022; Rshikesan et al., 2016).

The results of this study also have results in accordance with Fatkhurohmaningtias (2016) with the type of experimental research on 15 samples at Antares Fitness & Aerobic, with the results of yoga gymnastics exercises performed regularly causing weight loss based on the calculation of the average BMI before and after yoga, from an average of 26.11 to 23.96. Lestari's research (2018) at Studio 88 Gymnastics Studio Denpasar Bali on 26 respondents with the results of weight loss in the group doing yoga exercises with an average decrease in body fat percentage of 4.28% (Fatkhurohmaningtias & Yuliastrid, 2016).

The results obtained also have compatibility with several previous studies on the effectiveness of yoga, especially the boat pose movement on weight loss, including research by Rshikesan (2016) with a randomized controlled trial with parallel groups in the North east part of Mumbai on 40 respondents with the results of yoga exercises can reduce abdominal fat and reduce stress so that it has an impact on weight loss (p: 0.001) (Rshikesan et al., 2016). Hidayati's research (2015) in Karang Tengah Village Nogotirto Gamping Sleman Yogyakarta on 15 respondents with the results there is an effect of yoga practice on obesity (p: 0.002) (Hidayati, 2015). Research by Fatimah (2018) with the research subjects were 31 women aged 19-23 years who were divided into 2 groups, namely the treatment and control groups at Dee's Gymnastics Studio Tembalang with the results of weight loss in the group who did more yoga than in the control group (Fatimah et al., 2018). Lestari's research (2018) with the results there is an effect of yoga practice with weight loss with an average decrease in body fat percentage in the group doing yoga of 4.28% with a value of p=0.032 (Lestari et al., 2017).

The results obtained in this study are in accordance with several theoretical studies that illustrate that Boat Pose yoga can stimulate the abdominal organs, including the kidneys and intestines, which can improve digestion. Boat pose yoga also encourages healthy thyroid and prostate gland regulation, helps maintain metabolism and relieve stress (Caldwell et al., 2021). Boat Pose is effective in reducing body fat percentage in a faster way because it contains movements to burn calories involving various parts of the body such as arms, legs, neck, abdomen, hips and others (Batrakoulis, 2022).

Yoga boat pose movements reduce cortisol levels in the body so that it can control the increase in appetite due to stress (Dai et al., 2021). Breathing exercises in yoga are also useful for regulating and controlling breathing consciously including regulating the length and duration of inhalation, breath holding efforts and the length and duration of exhalation (Watts et al., 2018).

This conscious regulation of breathing can make the mind calm. Emotional stability can affect the working mechanisms of the hypothalamus, medulla oblongata and cerebri cortex (Jakicic et al., 2021; Lestari et al., 2017).

Yoga movements can also increase focus and awareness of the body, so that people will pay more attention to what they eat, so that only healthy foods are chosen so that they can lose weight. Yoga can also reduce stress. Stress is one of the triggers for overeating. With yoga, psychological conditions will also be better so that it will avoid eating activities due to emotions (D'Souza et al., 2022). In theory, yoga is not a high-intensity physical activity, the movements are slow, but the practice lasts long and continuously (Unick et al., 2022). This condition makes the muscles work hard all the time, the muscles contract and relax repeatedly, so that by doing this yoga activity regularly 4-5 times a week, the body's metabolism increases including the ability to burn calories (Tsopanidou et al., 2020). This activity will gradually form changes in body shape and even weight loss by doing yoga regularly (Jakicic et al., 2021).

The results of this study also obtained the results of acceptors who did not experience weight loss (25.3%) and there were even acceptors who actually experienced weight gain where this could be possible because from the results of the respondent's interview during the time span of the Yoga Boat Pose exercise intervention they continued to consume excessive food so that the effect of doing yoga was not so influential and there were even some acceptors who actually experienced an increase in body weight, where Yoga Boat Pose toga training should be more effective if accompanied by good dietary arrangements considering that body weight is influenced by the amount of energy used in daily activities and the amount of energy obtained from the food we eat. Excess calories are stored in the body as fat. Thus, if you want to lose weight, it must be accompanied by reducing the amount of food intake or increasing the amount of energy burned through physical activity.

Based on the results obtained, the weight loss in acceptors who do the yoga boat pose exercise can be caused because the yoga boat pose movement that focuses on the abdomen can eliminate fat and tighten the abdominal muscles. Boat pose can also strengthen the spine and improve the performance of important organs in the body, such as the kidneys and intestines. In addition, yoga movements help in increasing physical activity, causing the burning of body fat reserves to meet the body's calorie needs during yoga practice.

Related to the results obtained, the authors can recommend the practice of yoga boat pose to be done by 3-month injectable contraceptive acceptors or anyone who is experiencing weight problems in an effort to lose weight because it is proven to have an influence on weight loss and provide other effects on health and reduce stress and can also improve blood circulation if done properly and correctly.

# CONCLUSION

The BMI of 3-month injectable contraceptive acceptors before doing the Yoga Boat Pose exercise was mostly in the obese category (74.67%), with an average BMI value of 24.80 and an average body weight of 60.05 kg. After practicing Yoga Boat Pose, respondents who experienced weight loss were 49 people (65.33%), with BMI in the obese category being 55 people (73.33%), there were 2 acceptors who had normal BMI (2.67%). There is an effect of Yoga Boat Pose on the weight of 3-Month Injectable contraception Acceptors in the Hadimulyo Health Center Work Area, Mesuji Regency, Lampung Province with a p value <0.001.

The implementation of this study also experienced several limitations, including not all respondents in this study who routinely followed the exercise schedule, although the required amount of yoga was still achieved. The results of observations during the implementation of gymnastics there are still respondents who look less enthusiastic, and lack of motivation during gymnastics, this can cause yoga movements to be carried out not seriously, so that the benefits of the movements performed cannot be felt by respondents. In addition, researchers cannot control

other activities and consumption patterns of respondents outside of yoga, so this may be related to the presence of respondents who did not experience weight loss, some even experienced an increase in body weight.

This study provides further support for including yoga movements in obesity treatment programs. Not just relying on conventional diet and exercise, but also considering a holistic approach through yoga to achieve better results. Some suggestions that can be taken by future researchers to develop research on the effectiveness of yoga movements in weight loss are to expand the control group by considering groups that do not do physical exercise at all, groups that do other types of exercise, or groups that undergo other weight reduction methods will provide a more complete picture of the effectiveness of yoga.

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