

Intermittent Fasting on Fitness and Body Composition in Current and Former Athletes

Audrey Padilla, Alexander H.K. Montoye
Alma College, Alma, MI

Abstract

Introduction: Intermittent fasting is an eating strategy that limits the time of food intake to 6-10 hours per day with 14-18 hours of fasting. This strategy has been shown to improve the health of individuals who experience issues with obesity, metabolism, and pre-existing medical conditions, sometimes through weight loss but also by improved insulin sensitivity. There might also be a positive psychological impact and more consistent energy levels with intermittent fasting. Most research has focused on middle- and older-age adults, but less is known about the effect of intermittent fasting in younger adults. **Purpose:** The purpose of this study is to determine whether intermittent fasting is an effective tool for improving exercise performance and decreasing body fat percentage in young, college-aged individuals. **Methods:** This study will involve participants (n=4; 2 female, 2 male) who are college-aged (18-22 years old). The participants use a 16:8 (fasting: feeding) protocol and will determine their designated 8 hour feeding time and 16 hour fasting time that best suits their schedules. Food/beverage choices and Calorie consumption are not restricted, only the time window in which they can consume these items. At baseline testing, 5 weeks and 10 weeks after beginning intermittent fasting, participants will perform the following physical fitness tests: maximum sit ups in 2 minutes, maximum pushups in 2 minutes, maximum burpees in 2 minutes, and a submaximal test to predict aerobic power (VO2max). Additionally, participants will measure body circumferences in order to estimate body composition. Males will measure neck and abdomen circumferences; and females will measure abdomen, neck, and hip circumferences. Finally, participants will be tracking calories and exercise throughout the 10 weeks of intermittent fasting. **Conclusion:** This study hopes to determine whether intermittent fasting is an effective tool for body fat control, metabolic improvements, and improved exercise performance in young, college-aged adults. Results may be applied to young athletes to improve metabolism, body composition, and fuel utilization to maximize performance in athletics.

Introduction

• Nearly 32% of the nation's children are overweight, nearly 18% considered to be obese¹. 31.1% of adults in the U.S. are considered overweight³, 42.4% are considered obese as of 2020²

• Intermittent fasting is a dietary tool with periods of fasting and feeding

- Typical 16 hours fasting: 8 hours of feeding/ day

Benefits seen with intermittent fasting are:

- Weight loss
- Health improvements (decrease insulin resistance, improve BP, reduce inflammation⁴)
- Improvements in all aspects of health conditions

Research Gaps:

- There is little known about how intermittent fasting impacts current/former athletes.
- Past research has not shown long term impacts of intermittent fasting

Purpose

Determine whether intermittent fasting is an effective tool for improving fitness and decreasing body fat percentage in current/former athletes in 10 weeks

Methods

Equipment:

- Surveys:
 - PAR-Q survey, General Health Perspective Survey, PARQ-S survey
- MyFitnessPal phone application
- Soft measuring tape
- 16.25' step
- Heart Rate monitor (if manual, a watch)
- Watch

Participants

- 4 participants, ages 18-24, current/former college athletes
- Full-Time Students
- Participate in physical activity 3-5 times/week

Procedure

Timeline: 10-week data collection

Intermittent Fasting: Participants chose a time bracket of 16 hour fast/ 8 hour feeding schedule. Participants can consume liquids (coffee, tea, water, Gatorade) outside of the feeding window.

Pre-IF/ 5 weeks/ 10 weeks:

- Surveys
- Body Circumferences and weight
 - Males: abdomen, neck
 - Females: abdomen, neck, hip
- Fitness Tests
 - Max Sit-ups, push ups, burpees in 2 minutes
- Queens College Step Test

Data analysis

- Repeated-measures ANOVA was used to find statistical significance across the data collection points

THE 16/8 METHOD							
	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Midnight	FAST						
4 AM	FAST						
8 AM	FAST						
12 PM	First meal						
4 PM	Last meal by 8pm						
8 PM	FAST						
Midnight	FAST						

Results

Table 1: Participant Demographics

	Age	Height (cm)	Weight (kg)
Males (2)	21.5	182.2	79.6
Females (2)	21.5	167.6	64.25

Figure 1: Body Fat Percentages

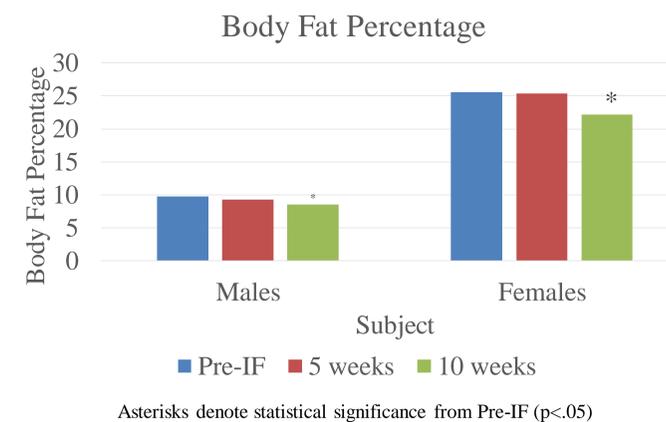


Table 2: Fitness Tests

	Males			Females			
	Pre-IF	5 weeks	10 weeks	Pre-IF	5 weeks	10 weeks	
Sit-ups	52	59	59.5	Sit-ups	56.5	66	71
Pushups	57.5	63.5	64.5*	Pushups	34	45	42*
Burpees	30.5	45.5*	45.5*	Burpees	32.5	43*	39.5*

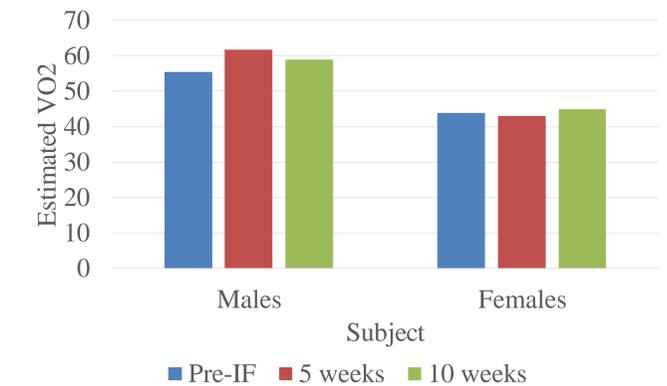
Asterisks denote statistical significance from Pre-IF (p<.05)

References

- Larery, T. The True Weight of Childhood Obesity in America. *The Midwest Quarterly*. 2011. <http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=2&sid=d9ef3144-fddf-4a15-b5a4-d6e13201c756%40dc-v-sessmgr03>. Accessed October 20, 2020.
- FastStats - Overweight prevalence. (2021, January 11). Retrieved February 24, 2021, from <https://www.cdc.gov/nchs/fastats/obesity-overweight.htm>
- Warren, M., Beck, S., & Delgado, D. (2020, September). The State of Obesity 2020: Better Policies for a Healthier America. Retrieved February 22, 2021, from <https://www.tfah.org/report-details/state-of-obesity-2020/>
- W. By, -. & Women Fitness Magazine. (2019, August 13). 9 incredible intermittent fasting results. Retrieved February 24, 2021, from <https://www.womenfitnessmag.com/9-incredible-intermittent-fasting-results/>

Results (cont'd.)

Figure 2: Estimated VO2 Max



Summary and Conclusions

- Body fat percentage significantly decreased, and both pushups and burpees significantly increased at 10 weeks of IF compared to Pre-IF
- Point estimates for body weight, sit-ups, and VO2 Max all trended in favorable directions at 10 weeks of IF compared to Pre-IF
- From these results, it can be concluded that in current/former athletes, intermittent fasting may contribute to favorable decreases in body fat percentage as well as improvement in VO2 Max and fitness
- Future directions from this study could involve the effects of IF on specific sports, sport specific activities or effects of IF on athletes with pre-existing conditions.



ALMA COLLEGE