

# BODY COMPOSITION CHANGES IN POLICE OFFICERS FOLLOWING WEIGHT LOSS AND FITNESS PROGRAMS

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## ABSTRACT

Achieving and maintaining a body composition classified in the healthy range is an important indication of current and long-term health and risk of disease. Body composition can be changed through implementation of proper nutrition and fitness. InBody bioelectrical impedance analysis body composition assessments can be utilized to track body composition changes as a result of this lifestyle implementation overtime. **PURPOSE:** to examine changes in body composition following a weight loss and fitness program in a group of university police officers. **METHODS:** 9 adult police officers aged 26-59 who participated in a weight loss and fitness improvement challenge served as the participants for this research. Research participants underwent an initial InBody assessment and then repeated the InBody assessment after 8 weeks. Fat Mass (FM), Fat Free Mass (FFM), and Percent Body Fat (PBF) were measured and compared from initial assessment (n = 9) to the follow-up assessment (n=6). Not all participants attended the follow-up assessment. **RESULTS:** All participants lost body weight and body fat within expected ranges, suggesting that the fitness and weight loss regimens followed were effective at eliciting these outcomes.

## INTRODUCTION

The prevalence of overweight and obesity now exceeds 60% in adults in the United States [1]. Those with an increased amount of body fat are especially at risk for becoming overweight and/or obese, and therefore acquiring the negative health implications that can accompany these conditions. With overweight and obesity, increased rates of hypertension, diabetes, dyslipidemia, among other medical conditions threaten to shorten the longevity of the American populace by as much as 5 years [1]. To get the best gauge of health, it's ideal to distinguish between general weight and actual specific body composition in order to assess the amount of body fat in comparison to amounts of muscle, as it is the body fat, and not necessarily body weight, that is related to health risk. Body composition can be assessed using a variety of methods, including underwater weighing, air-displacement plethysmography, skinfold caliper assessment, and bioelectrical impedance. Of these, bioelectrical impedance is the easiest, quickest, and least invasive method. Bioelectrical impedance uses an electrical current to detect differences in body composition using the water content of each tissue. This painless current is passed through the body, and the resulting impedance values provide information on body water, body fat and muscle mass. This method, in general, has been shown to have a standard error of the estimate (SEE) of between 3 and 5% when compared to gold standard methods [1]. One specific method of carrying out bioelectrical impedance, the InBody, has been shown to have an even smaller SEE when compared to dual-energy x-ray absorptiometry [2]. The purpose of this study was to use the InBody bioelectrical impedance analyzer to determine changes in body weight, body fat, and fat free mass after 8 weeks of a self-led fitness and weight loss regimen.

## METHODS

### PARTICIPANTS

Subjects consisted of 9 police officers who planned to participate in a fitness improvement and weight loss program during the spring semester of 2021. The subjects (8 men, 1 woman) were 43.6 ±12.2 years of age, with an average height of 70.6 ±3.8 inches, and an average weight of 216.3 ±30.7 lbs.

### PROCEDURES

Body composition was assessed prior to and following 8 weeks of a self-led fitness and weight loss program using an InBody bioelectrical impedance analyzer. Subjects were asked to follow a series of test preparation guidelines prior to participating in the InBody test. These guidelines prior to testing included: maintaining normal fluid intake the day before; removing any socks or pantyhose before the test; removing all heavy objects such a jewelry, watches, belts, wallets, and jackets; not eating or exercising for at least 3 hours; not consuming alcohol or excessive caffeine for at least 24 hours; and not using lotion on the hands or feet. The self-led fitness and weight loss regimen differed from subject to subject.

## STATISTICAL ANALYSIS

Means and standard deviations were calculated using excel for subjects at both measurement sessions. Changes from the initial assessment to the follow-up assessment in weight, fat mass, fat free mass, and body fat % were also calculated.

## RESULTS

Body composition will be assessed once more over the course of the program, but initial body composition results indicated that the mean fat mass was 61.7 ± 23.3 lbs, the mean fat free mass was 87.8 ± 16.7 lbs, and the mean body fat was 28.3 ± 9.6 %.

The follow-up assessment of body composition results indicated that the mean fat mass was 50.9 ± 19.7 lbs, the mean fat free mass was 90.4 ± 15.7 lbs, and the mean body fat was 24.4 ± 10.1 %.

Individual results as well as means and standard deviations are shown in Tables 1 and 2.

## TABLES

INITIAL ASSESSMENT					
ID#:	Sex:	Weight (lbs):	Fat Mass (lbs):	Fat Free Mass (lbs):	Body Fat %:
1201	F	204.6	91.7	62.4	44.8
1204	M	196.1	44.0	86.2	22.4
1206	M	241.2	75.4	94.8	31.3
1207	M	217.5	35.6	105.2	16.4
1208	M	247.6	64.6	103.8	26.1
1209	M	210.7	46.9	92.2	22.3
1210	M	152.7	32.5	67.2	21.2
1211	M	224.5	94.9	73.2	42.2
1220	M	251.5	70.1	105.6	27.9
Mean:	N/A	216.3	61.7	87.8	28.3
SD (+ OR -)	N/A	30.7	23.3	16.7	9.6

Table 1. Body composition results from Initial Assessment

FOLLOW-UP ASSESSMENT (WITH CHANGE)					
ID#:	Sex:	Weight (lbs):	Fat Mass (lbs):	Fat Free Mass (lbs):	Body Fat %:
1201	F	196.3 (-8.3)	85 (-6.7)	62 (-0.4)	43.3 (-1.5)
1204	M	188.9 (-7.2)	35.7 (-8.3)	87.1 (+0.9)	18.8 (-3.6)
1206	M	221.1 (-20.1)	59.5 (-15.9)	92.6 (-2.2)	26.9 (-4.4)
1207	M	208.5 (-9)	29.9 (-5.7)	103.4 (-1.8)	14.4 (-2)
1208	M	236.5 (-11.1)	50.9 (-13.7)	105.8 (+2)	21.5 (-4.6)
1209	M	207.5 (-3.2)	44.6 (-2.3)	91.5 (-0.7)	21.5 (-0.8)
1210	M				
1211	M				
1220	M				
Mean:	N/A	209.8	50.9	90.4	24.4
SD (+ OR -)	N/A	17.1	19.7	15.7	10.1

Table 2. Body composition results following 8 week of fitness and weight loss regimen

## CONCLUSIONS AND DISCUSSION

The average body weight loss by the participants was 9.8 lbs. and the average % fat loss was 2.8%, which is comparable to the averages of 8.1 lbs. and 3.1%, respectively, reported in a recent meta-analysis of exercise interventions for weight loss(4). Maximal recommended weight loss/week is 1-2 lbs., or 8-16 lbs. over the course of 8 weeks. Most participants fell within that range and saw associated reductions in % fat, suggesting that the weight loss and fitness regimens followed are effective methods for reducing body weight and body fat.

## REFERENCES

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