

Abstrakt

Introduction

Bodybuilding is viewed multidimensionally: socially, physically, and psychologically. According to the Polish Dictionary, bodybuilding is defined as a "set of exercises performed with appropriate equipment and on special devices, providing a person with a muscular physique and physical fitness." Research indicates that over a 10-week period of resistance training, the value of lean body mass can increase by approximately 1.4 kg, resting metabolism can increase by 7%, and body mass can decrease by 1.8 kg. However, there is no consensus on the relationship between the number of repetitions and external resistance in recreational strength and muscle mass development. The aim of this study was to investigate the impact of experimental strength training on selected morphological and functional parameters of individuals engaged in recreational bodybuilding.

Materials and Methods

A total of 40 individuals were divided into two groups (mean age 26.1 years, SD 2.1 years). The participants were randomly assigned to two equal groups. The training was conducted for 16 weeks according to the described program (Table 4 and 5). The first 8 weeks involved the following:

1. 4 weeks of training all muscle groups 3 times a week.
2. 4 weeks of split training.

Group I was renamed Group Ib after the first 8 weeks and followed the program of Group II from the first 8 weeks. Meanwhile, Group II was renamed Group IIb and followed the program of Group I from the first 8 weeks. After the initial 8 weeks of training, a seven-day recovery period was implemented. Three measurement points were conducted (I-pre, II-after the first 8 weeks, III-after the subsequent 8 weeks).

The participants in the first group were to achieve submaximal intensity in strength exercises (80% 1RM, 4 sets, 6-8 repetitions, 1-minute rest between sets). The participants in the second group performed the same set of exercises but at a moderate intensity (40-60% 1RM, 4 sets, 15-20 repetitions, 1-minute rest between sets). Somatic parameters (height, body weight, BMI calculated, body circumferences), morphological parameters (percentage of body fat, fat tissue mass, lean body mass), and functional parameters measured through physical fitness tests (incremental test - VO₂max measurement, sit-ups, pull-ups, hanging time on a bar, bench press

1RM, bench press with a 30 kg weight, classic squat 1RM, standing long jump, shuttle run, sit and reach test) were examined. Morphological and functional parameters were assessed three times.

Results

Group II participants had a higher amount of lean body mass, left arm circumference, and left thigh circumference ($p < 0.05$). After the intervention in Group I, a significant increase in lean body mass by 2.1% ($p < 0.05$), an increase in right thigh circumference (difference of 1.25 cm, $p < 0.05$), and left thigh circumference (difference of 1.25 cm, $p < 0.05$) were observed. They also improved their performance in physical fitness tests such as the sit-ups test, pull-ups, hanging time on a bar, bench press 1RM, shuttle run, and sit and reach test ($p < 0.05$). After the intervention in Group II, an increase in lean body mass by approximately 2% was observed ($p = 0.037$). Physical fitness results improved in all assessed parameters ($p < 0.05$). The effectiveness in the first 8 weeks varied between no effect (pull-ups and bench press 1RM) and moderate effect (hanging time on a bar). Greater effects were observed in fat mass reduction in Group I, while in Group II, it was observed during the hanging time on a bar. The effectiveness in the subsequent 8 weeks varied between no effect (bench press 1RM) and significant effect (sit-ups test, hanging time on a bar). Greater effects were observed in hanging time on a bar in Group Ib, while for Group IIb, it was observed in the sit-ups test.

Conclusions

1. Experimental training increases the level of morphological parameters such as lean body mass (indicating increased muscle mass) and functional parameters such as aerobic endurance, upper and lower limb strength, and trunk strength in individuals engaged in recreational bodybuilding.
2. Improved results in dynamic muscle strength tests of the abdomen, pull-ups, hanging time on a bar, bench press 1RM, shuttle run test, and sit and reach test demonstrate improved physical fitness in the participants.
3. Both low and high external resistance training increase morphological and functional parameters.
4. The effectiveness of developing upper limb, lower limb, and trunk strength is comparable in both cases. Lean body mass and BMI contribute to differences in the functional parameters of the body between different types of training.