THE EFFECTS OF MANUAL RESISTANCE TRAINING ON FITNESS TEST ACHIEVEMENT SCORES IN ADOLESCENTS

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Abstract

A primary public health issue is the high prevalence of obesity and low level of fitness among children and adolescents. Schools have a critical role to play in the promotion of physical fitness and health among children. Most traditional resistance training exercises may be simulated using limited equipment (chairs, PVC pipes, straps) and are therefore feasible for implementation in schools. However, due to high equipment costs, traditional resistance training is often excluded from physical education classes. Manual resistance training (MRT) systems are appropriate for school physical education classes. However, due to high equipment costs, traditional resistance training is often excluded from physical education classes. A Manual Resistance Training (MRT) system is effective in improving adolescents’ physical fitness in a short period of time.

Purpose

The purpose of this study was to document the physical changes in adolescents through the application of Manual Resistance Training (MRT) in physical education settings.

Methods

Students were pre-tested on their physical attributes by the Fitnessgram assessment tool, including the 1-mile run, curl-up, push-up, trunk lift, flex arm hang, and modified pull-up tests; and by skinfold measurements for percentage of body fat.

Students were assigned into one of three groups: MRT, MRT plus endurance (MRT+E) or control (Control) group.

Control group students attended their regular physical education classes without any modifications; classes of the experimental groups were complemented with the MRT system and a cardiovascular cardio training component was added for the MRT+E group.

All classes met three times per week and assessments were conducted prior to the intervention, at 9 weeks, and at 18 weeks.

Results

Data were analyzed using a General Linear Mixed Model Analysis with Tukey’s post-hoc procedure for mean comparisons.

At baseline, there were no significant group differences for age, height, weight, BMI, skinfold, and five of the Fitnessgram measures (p > 0.05).

The Control group from pre- to post-test showed

- no significant change in BMI
- no significant decrement in mile run and skinfold measures
- significant increase in curl-up, trunk lift, push-up, flex arm, and pull-up tests

The MRT group from pre- to post-test showed

- no significant change in BMI and mile run
- significant decrement in skinfold measure
- significant increase in curl-up, trunk lift, push-up, flex arm, and pull-up tests

The MRT+E group from pre- to post-test showed

- no significant change in BMI and skinfold measure
- significant improvement in mile run, curl-up, trunk lift, push-up, pull-up tests

MRT group was significantly better than Control group in mile run, curl-up and push-up measures at mid-term and post-test, and in trunk lift at mid-term

Conclusions

A Manual Resistance Training enhanced physical education program appears to be effective in improving adolescents’ muscular fitness as measured by the Fitnessgram. A combined MRT and cardiovascular endurance training program effectively improves cardiovascular and muscular fitness but appears ineffective in improving adolescent body composition within 18 weeks.

Practical Applications

A Manual Resistance Training system is appropriate for school based physical education. An MRT enhanced physical education program, complemented with cardiovascular endurance training, is effective in improving adolescents’ physical fitness in a short period of time.