THE EFFECTIVENESS OF MANUAL RESISTANCE VERSUS WEIGHT TRAINING ON FITNESS TEST ACHIEVEMENT SCORES IN ADOLESCENTS

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ABSTRACT

Manual Resistance Training (MRT) has recently gained popularity and previous research suggested that MRT may be effective in improving muscular fitness in adults. As resistance training is an effective method to improve the fitness of adolescents, a variety of resistance training modalities have been applied to this population. The advantage of the MRT modality is the lack of need for specialized equipment, making it easier to implement and less expensive than traditional weight training. The study compared the effect of MRT and traditional weight training (WT) on core fitness measures in a sample of adolescents attending a public school in El Paso, Texas. The children were assigned to either the MRT or WT groups. The MRT program involved manual resistance training exercises, while the WT program involved standard weight training exercises. Both groups met three times per week for 18 weeks and all students were tested prior to the intervention, at 9 weeks, and at 18 weeks. The results show that the MRT group achieved greater improvements in the first half, and maintained such measures, while the WT group showed greater improvements in the second half. The MRT modality appears to be effective in improving adolescents’ fitness scores within 9 weeks of program application.

INTRODUCTION

• In Manual Resistance Training (MRT) trainees work in pairs, with one being the lifter and the other being the spotter
• The resistance for any given exercise is provided by the spotter
• Most resistance training exercises may be simulated by MRT with the assistance of a spotter
• The MRT modality appears to be effective in improving adolescents’ fitness scores within 9 weeks of program application.

METHODS

• Research design included an 18-week longitudinal training intervention for high-school students with pre-, mid-, and post-test
• Adolescents were pre-tested by the Fitnessgram assessment tool, including the 1-mile run, curl-up, push-up, trunk lift, flexed arm hang, and modified pull-up tests
• Adolescents in their school-based PE classes were assigned into either the MRT or the WT protocol
• PE classes were complemented with the MRT or WT workout sessions, three times per week for 30-45 minutes each
• All classes met three times per week and were assessed prior to the intervention, at 9 weeks, and at 18 weeks
• Transformed data were analyzed using a General Linear Mixed Model Analysis with Tukey’s post-hoc procedure
• Criterion alpha level for significance was set at p ≤ 0.05

RESULTS

• At baseline, there were no significant differences between groups for age, height, and weight (p>0.05)
• At baseline, the WT group scored significantly higher in all measures of the Fitnessgram tool (p<0.0001)
• At 9-week both groups showed significant improvements from baseline in the curl-up and trunk lift measures (p<0.0002)
• Only the MRT group showed significant improvements (p<0.0001) in the 1-mile run, push-up, flexed arm, and pull-up measures
• By 9-week significant group differences disappeared for the curl-up, trunk lift, push-up, and pull-up measures (p>0.54)
• With the exception of the push-up measure for the WT group, neither group showed further significant improvement from 9-week to 18-week in any measures (p>0.09)
• From baseline to 18-week both groups showed significant improvements in curl-up, trunk lift and push-up tests (p<0.05), but only the MRT group showed significant improvements for the 1-mile run, flexed arm hang, and modified pull-up tests (p<0.0004)

CONCLUSION

The WT program was effective in improving some fitness measures, while the MRT appeared to be effective in improving all measures. Adolescents trained by the MRT modality achieved greater improvements in the first half, and maintained such improvements in the second half of the 18-week intervention. Adolescents in the WT group generally made smaller but more progressive improvements throughout the intervention. The MRT group’s lower level of initial fitness may be a reason for this phenomenon.

PRACTICAL APPLICATION

Both the MRT and the traditional WT systems appear to be appropriate for improving Fitnessgram scores within school-based physical education programs. The MRT modality appears to be effective in improving adolescents’ fitness scores within 9 weeks of program application.

ACKNOWLEDGEMENTS

The study was supported by the National Institutes of Health, National Center on Minority Health and Health Disparities (Grant # P20 MD000548), a joint venture of The University of Texas at El Paso and The University of Texas Health Science Center at Houston School of Public Health and by the NIH Research Centers in Minority Institutions (Grant # 5G12 RR08124).