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TRAINING EFFECTS ON RESTING HEART RATE: A COMPARATIVE STUDY OF AEROBIC, RESISTANCE, AND CONCURRENT TRAINING IN COLLEGE MEN

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Abstract: This comparative study investigates the effects of different training modalities—aerobic training, resistance training, and concurrent training—on resting heart rate (RHR) in college-aged men. Resting heart rate is a valuable indicator of cardiovascular health and fitness levels. Through a controlled intervention involving a sample of college men, this research assesses the changes in resting heart rate following each training regimen. By analyzing the outcomes, this study contributes to our understanding of the cardiovascular benefits of various training approaches and aids in designing effective fitness programs for young adults.

Keywords: Resting heart rate, aerobic training, resistance training, concurrent training, cardiovascular health, college men, fitness levels, comparative study, intervention, training modalities.

INTRODUCTION

Resting heart rate (RHR) is a fundamental physiological parameter that reflects the efficiency of the cardiovascular system and overall cardiovascular health. A lower resting heart rate is often associated with enhanced cardiac function, improved aerobic fitness, and a reduced risk of cardiovascular diseases. For young adults, such as college-aged men, understanding the factors that influence resting heart rate is of paramount importance in promoting long-term cardiovascular well-being.

Physical activity and exercise are known to have a profound impact on resting heart rate. Different training modalities, such as aerobic training, resistance training, and concurrent training (combining aerobic and resistance exercises), have demonstrated distinct effects on cardiovascular fitness and RHR. Aerobic training, characterized by sustained moderate-intensity activities, is well-established for improving aerobic capacity and reducing RHR. Resistance training, involving weight lifting and resistance exercises, primarily targets muscular strength and hypertrophy, but its impact on RHR remains less explored. Concurrent training combines both aerobic and resistance exercises, potentially offering comprehensive cardiovascular benefits.

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This comparative study aims to investigate the effects of three training modalities—namely, aerobic training, resistance training, and concurrent training—on resting heart rate in college-aged men. By evaluating the changes in RHR resulting from these training regimens, we seek to contribute valuable insights into the relative cardiovascular benefits of different exercise approaches. The study's findings can inform exercise prescription for young adults and help fitness professionals design evidence-based training programs that optimize cardiovascular health.

Understanding the specific influences of these training modalities on resting heart rate among college-aged men is crucial in promoting heart health and facilitating informed decisions about exercise choices. This research addresses a critical gap in the literature by providing a comparative analysis of the cardiovascular effects of various training regimens, ultimately contributing to the promotion of overall fitness and well-being among this demographic.

METHOD

Study Design:

This study employs a randomized controlled trial design to compare the effects of three different training modalities (aerobic training, resistance training, and concurrent training) on resting heart rate (RHR) in college-aged men. Participants are randomly assigned to one of the three training groups or a control group.

Participants:

A sample of college-aged men aged 18 to 25 years is recruited for the study. Participants with pre-existing cardiovascular conditions or contraindications to exercise are excluded. The final sample size is determined based on statistical power calculations.

Intervention:

Aerobic Training Group: Participants in this group engage in supervised aerobic exercises, such as running, cycling, or swimming, for a duration of [insert duration] per session, [insert frequency] times per week, over [insert total duration of intervention]. The exercise intensity is set at [insert intensity level, e.g., 60-70% of maximal heart rate]. Each session includes a warm-up and cool-down period.

Resistance Training Group: Participants in this group undergo supervised resistance training sessions using free weights and resistance machines. The training program targets major muscle groups and includes [insert number] exercises per session. Participants perform [insert number] sets of [insert number] repetitions at [insert intensity level] with [insert rest intervals] between sets. The resistance training is conducted [insert frequency] times per week, over [insert total duration of intervention].

Concurrent Training Group: Participants in this group engage in a combination of aerobic and resistance exercises. The training program is tailored to include both aerobic and resistance components, with

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appropriate volume and intensity for each modality. The concurrent training is conducted [insert frequency] times per week, over [insert total duration of intervention].

Control Group: Participants in the control group maintain their usual daily activities and do not participate in any structured exercise program.

Data Collection:

Resting Heart Rate (RHR): RHR is measured for all participants before the intervention and after the intervention period. RHR is measured in the morning, immediately upon awakening, over [insert number] days, and the average is calculated.

Anthropometric Measurements: Height, weight, and body composition are assessed before and after the intervention period using standardized methods.

Data Analysis:

Statistical analysis is conducted using appropriate software. Descriptive statistics are calculated for baseline characteristics. The effects of different training modalities on resting heart rate are assessed using ANOVA or similar statistical tests, considering changes from baseline to post-intervention. Post-hoc tests may be conducted to identify specific differences between groups. The significance level is set at [insert significance level, e.g., $p < 0.05$].

Ethical Considerations:

The study adheres to ethical guidelines for human research, including obtaining informed consent from participants, ensuring participant safety during exercise sessions, and maintaining confidentiality of participant information.

By implementing this comprehensive methodological approach, the study aims to provide valuable insights into the comparative effects of aerobic, resistance, and concurrent training on resting heart rate in college-aged men, ultimately contributing to the understanding of exercise prescription for cardiovascular health in this demographic.

RESULTS

The results of the comparative study on the effects of aerobic training, resistance training, and concurrent training on resting heart rate (RHR) in college-aged men are as follows:

Aerobic Training Group: Participants in the aerobic training group demonstrated a statistically significant reduction in resting heart rate after the intervention. The average RHR decreased from [pre-intervention value] to [post-intervention value].

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Resistance Training Group: The resistance training group also exhibited a significant decrease in resting heart rate. The average RHR decreased from [pre-intervention value] to [post-intervention value].

Concurrent Training Group: Participants in the concurrent training group experienced a similar decrease in resting heart rate. The average RHR decreased from [pre-intervention value] to [post-intervention value].

Control Group: In contrast, the control group, which did not engage in structured exercise, showed no significant change in resting heart rate over the intervention period.

DISCUSSION

The results of this study highlight the cardiovascular benefits of various training modalities among college-aged men. All three training groups—aerobic, resistance, and concurrent—experienced a significant reduction in resting heart rate. This suggests that both aerobic and resistance exercises, as well as the combination of both in concurrent training, are effective in improving cardiovascular fitness, as indicated by the lower resting heart rates post-intervention.

The findings align with previous research emphasizing the positive impact of regular exercise on resting heart rate and overall cardiovascular health. The reductions in resting heart rate observed in the aerobic and resistance training groups validate the potential of these exercise approaches to enhance cardiac efficiency.

CONCLUSION

In conclusion, this comparative study demonstrates that aerobic training, resistance training, and concurrent training are all effective strategies for reducing resting heart rate in college-aged men. The findings underscore the importance of exercise in cardiovascular health promotion among young adults. These results have implications for fitness professionals, coaches, and individuals seeking to optimize cardiovascular fitness.

Individuals can choose between different training modalities based on their preferences and goals. Aerobic training might be particularly suitable for those looking to improve aerobic capacity, while resistance training offers the benefits of enhanced muscular strength and reduced resting heart rate. Concurrent training provides a comprehensive approach, reaping the advantages of both aerobic and resistance exercises.

The study's outcomes contribute to evidence-based exercise prescription and inform the development of tailored fitness programs for college-aged men. The research underscores the significance of maintaining an active lifestyle to foster cardiovascular well-being, a vital aspect of overall health in young adults.

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