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Aquarobics Intervention Improved Metabolic Profile and Reduced Inflammatory Markers in Female

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Background: Chronic low-grade inflammation and metabolic irregularities are strongly associated with obesity, increasing the likelihood of type 2 diabetes, insulin resistance, and cardiovascular diseases. Aquarobics, a low-impact aerobic exercise performed in water, can provide a safe and effective method to enhance the metabolic health of obese individuals. This study aimed to evaluate the impact of a structured aquarobics program on the metabolic profile and inflammatory markers in individuals with obesity. Methods: A quasi-experimental study was conducted with 40 obese individuals (BMI ≥30 kg/m²), aged between 15-20 years. Participants were allocated to either an intervention group (n=20), which engaged in supervised aquarobics three times weekly for 12 weeks, or a control group (n=20) that did not participate in any organized physical activity. Blood samples were obtained before and after the intervention to evaluate lipid profiles (total cholesterol, HDL, LDL, triglycerides), fasting glucose levels, and inflammatory markers (CRP and IL-6). Body composition and VO_2max were also assessed. Results: After 12 weeks, the intervention group exhibited notable enhancements in HDL levels ($p<0.01$), along with decreases in LDL, total cholesterol, triglycerides, and fasting glucose ($p<0.05$). The inflammatory markers CRP and IL-6 showed a significant reduction compared to baseline experienced a 12.4% improvement in VO_2max ($p<0.01$) and a 3.8% reduction in body fat percentage ($p<0.05$). After 12 weeks, the intervention group showed significant improvements showed significant improvements in HDL levels ($p<0.01$), reductions in LDL, total cholesterol, triglycerides, and fasting glucose ($p<0.05$). Inflammatory markers CRP and IL-6 also decreased significantly compared to baseline ($p<0.01$), while no significant changes were observed in the control group. VO_2max improved by 12.4% ($p<0.01$) and body fat percentage decreased by 3.8% ($p<0.05$) in the intervention group. Conclusion: Aquarobics is an effective non-pharmacological strategy for improving metabolic profile and reducing systemic inflammation in obese adults. This water-based intervention can be recommended as a safe, accessible exercise modality for obesity management and cardiometabolic risk reduction.

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