The Effect of Water Depth on Energy Expenditure and Perception of Effort in Female Subjects While Walking

Wafa Alkurdi, David R. Paul, Kelsey Sadowski, and Denis G. Dolny
Health, PE, and Recreation and Dance Department at University of Idaho

Purpose:
This study was conducted in order to compare energy expenditures, heart rate, and perceived effort during walking in water at several depths versus land in female participants.

Method:
Eighteen females participated in this study. Participants on three separate days in one week on a land treadmill, walking six, five minute bouts at different speeds with a three minute rest period between each bout. Participants walked followed the same procedures at different depths on a HydroWorx underwater treadmill on a different week. During each walking bout heart rate, oxygen consumption, and carbon dioxide production were recorded continuously.

Results:
Minor changes in water depth significantly influenced cardiorespiratory variables and the subject’s perception of effort during walking on an aquatic treadmill. Heart rate, energy expenditure, and rate of perceived effort increased significantly as water depth was lowered by twenty centimeters.

Conclusion:
These results suggest water depth can be used to selectively adjust exercise intensity during water walking. Therefore, substituting aquatic treadmill walking for land walking might be beneficial for overweight individuals as they strive to incorporate physical activity into their lifestyle.