Can You Lose Weight With Water Exercise

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OF COURSE
YOU CAN!
Fat Loss and Water Exercise

- Heart rates are not as high in the water— not as good a workout.
- Don’t burn as many calories because you are not bearing as much weight.
- Cooling affect of the water may alter metabolic affects.
- Less post-exercise energy expenditure because you recover faster in the water.
Caloric Expenditure

Number of calories you burn in exercise is dependent upon:

- The weight you bear (mode of exercise)
- Intensity
- Duration
- Environmental factors
  - Temperature, humidity, clothing
- Individual characteristics
  - Age, fitness level, gender, body composition
Heart Rate Methods

- **Used to estimate** energy expenditure
- **Has a linear relationship with** workload/ intensity just like oxygen consumption.
- **Heart rate is affected by** environment, medication, stress, etc.
- **Can be unreliable.**
HR and VO2 Linear Relationship

WORKLOAD

HR
Or
VO2
Direct Calorimetry

- Large airtight chamber
- Rigid engineering requirements
- Measure amount of heat body produces
- Measuring heat in exercise is difficult because of sweating, evaporation, heat given off by equipment, etc.
Indirect Calorimetry

- Measurement of oxygen consumption.
- Measure O2 in, and O2 out and the difference is used by your body.
- Can measure resting, submaximal, or maximal oxygen consumption.
Oxygen Consumption

- Indicates energy expenditure
- Indicates type of fuel being used
- Indicates how many calories are burned/minute
Heart Rates in the water are affected by:
- Hydrostatic pressure
- Water’s cooling effect
- Body mass
- Partial pressure
- Dive reflex
- Gravity
Heart Rates in Water

Research clearly indicates:

- Heart rates in the water are lower than heart rates on land at a given oxygen consumption during:
  - Rest
  - Submaximal exercise

- Heart rates are suppressed in the water and do not accurately reflect oxygen consumption. (underestimate)
Heart Rate Measurement in Water

- Can be unreliable just as on land
- Will need to be adjusted- lowered
- Adjustment dependent upon:
  - Individual responses to submersion
  - Intensity of exercise
  - Depth of water
  - Fitness level
  - Age
Unfavorable Results

- Inaccurate measurement of intensity and caloric consumption.
- Study not long enough to properly investigate weight loss or body composition changes. (minimum of 12 weeks recommended)
- Inadequate intensity. Misunderstanding of movement in water.
The issue of post exercise caloric expenditure after water exercise is less clear.

Recovery in the water would facilitate venous return, lactate removal, and heart rate recovery.

Post exercise energy expenditure dependent upon:
- Water temperature, length of time spent in the water after exercise, environmental, and individual factors

Jury is still out:
How post exercise calorie consumption in the water compares to post exercise calorie consumption on land.

Still not enough research at this point to draw any firm conclusions.
Upper extremity exercise:
(abduction, transverse adduction, transverse abduction, adduction)
– Land: 2- 3.5 METS
– Water: 3- 6 METS

Lower extremity exercise:
(front kick)
– Land: 4- 6.5 METS
– Water: 6- 9 METS
Cassedy et al continued

Combined arm and leg movement:

- 7- 15 METS
- 10- 11 minute mile
- 400 – 500 calories per hour of exercise.
Darby 2000

- Leg only and leg/arm exercises on land and in chest deep water at various intensities.
- Even when water pace adjustments were made- Kcal were 1-2 kcal/minute higher in the water depending on the intensity.
- 60-120 more kcals in the water.
- Results = “good place to exercise for those trying to lose weight”
“Even though the landing or loading forces due to gravity were reduced because the participants were exercising in the water, energy expenditure per unit of time was increased.”

This is not the only study that indicates that the water’s drag properties make up for the loss of energy expenditure due to reduced body mass.
Effect of Body Cooling on O2 Transport

- Body cooling results in an increase in resting metabolism proportional to the decrease in core temperature.
- Oxygen supply to meet cost of activity is decreased due to respiratory effectiveness, cardiac function, muscle blood flow.
- Exercise in vasoconstriction environment/core temperature too low- affects oxygen transport to muscles.
Pendergast continued...

- SUGGESTED that water temperature may affect VO2.
- A water temperature around 29 C/84 F was recommended to optimize oxygen consumption.
Coad 1987

- Treadmill Walking: 4.0 kcal/min
- Treadmill Running: 11.8 kcal/min
- Deep Water Walking: 8.78 Kcal/min
- Deep Water Running: 11.5 kcal/min
DeMaere 1997

- DWR 60% VO2peak 13.5 kcal/min
- TMR 60% VO2peak 13.8 kcal/min
- DWR 80% VO2peak 18.9 kcal/min
- TMR 80% VO2peak 19.2 kcal/min

Higher carbohydrate oxidation and lower fat oxidation during deep water running.
Increased caloric intake soon after exercise in cold water.

- 45 min on a submersed cycle ergometer at 60% VO2max in 33 C/ 91 F thermo neutral, 20 C/ 68 F for cold water, and a resting trial.
- Ate 44% more calories after cold water exercise than with thermo neutral.
- Ate 41% more calories after cold water than resting conditions.
“Water temperature warrants consideration in aquatic programs designed for weight loss.”
Land Study- respiration chamber for 60 hours in normal clothing executing a standardized daily activities protocol.

- Overeating under ad libitum circumstances at 16 C/ 61 F corresponded to a decrease in core body temperature.
- During ad libitum feeding, subjects over ate by an average of 32% at 22 C/ 72 F and by an average of 34% at 16 C/ 61 F.
Caloric Consumption During Vertical Water Exercise

- Just as on land, several variables affect the amount of energy used in vertical water exercise:
  - Water depth
  - Speed of movement
  - Amount of force applied against the water’s resistance
  - Length of the person’s limbs
Caloric Consumption During Vertical Water Exercise

- Water temperature
- Air temperature
- Humidity
- Age
- Fitness level
- Gender
- Body composition
Let's Revisit the Issue of Fat Loss and Water Exercise

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- Don’t burn as many calories because you are not bearing as much weight.
- Cooling affect of the water may alter metabolic affects.
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Ideal Conditions

- Water temperature 83-86 F / 28.5-30 C
- Chest deep water
- Work at appropriate intensity level-50-85% HRR (ACSM)
  - 40-60% HRR increasing duration and frequency first
  - Eventual progression to 50-75% HRR
Ideal Conditions

- Work for appropriate duration- 20-60 minutes (ACSM)
  - For weight loss, 45-60 minutes is recommended.

- Lower intensity, longer duration exercise is still prescribed for weight loss.
Ideal Conditions

- Resistance training is an important part of weight loss efforts.
  - The water provides resistance with reduced impact load.
  - Additional RT should be considered in the water.

- Exercise through full range of motion and incorporate a post stretch to retain and build flexibility.
Can you lose weight with water exercise?

OF COURSE
YOU CAN!
Collecting testimonial research on weight loss with vertical water exercise.
Go on line with AEA to get details.
Stop by the Innovations in Aquatics Center and pick up a copy of the survey. You can fill it out and leave it in any evaluation box.