

Research reviews



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'The metabolic cost of Hatha yoga'

Authors: Clay, Lloyd, Walker et al., Texas State University, San Marcos, Texas

Source: *Journal of Strength and Conditioning Research*, 19(3), pp 604-610, 2005

A few weeks after a long day at work and the next thing I know I am at the physiotherapist's office being treated for a muscle strain. I'm told I have the flexibility of an old man. Now, I'm old, but not *that* old, and I'm flexible, just not *that* flexible! And so, my investigation into flexibility exercise training begins (stress management would also be helpful).

Millions of individuals around the world practise varying forms of yoga every day, and the photos generally show some degree of contortion by young and old folks alike, so yoga seemed like a good place to start for me.

Yoga is an ancient Indian practice, dating back at least 5,000 years, which typically consists of poses, breathing and meditation. It is claimed to be the union and integration of every aspect of a human being.

Dr Clay and colleagues investigated the effects of Hatha yoga in female volunteers (aged 19 to 40) who were participating in a lifetime fitness and wellness yoga class. Hatha yoga (in brief) consists of practising asanas (lying, sitting, standing static postures), pranayamas (breathing techniques), yamas (truthfulness/non-violence), and niyamas (body and sense).

Research: subjects completed a 30-minute Hatha yoga exercise regime, which included 5 minute warm-up, 20 minutes of conditioning asanas, and a 5 minute cool-down. During the conditioning phase, asanas were held for 20 seconds. The yoga was compared to resting in a chair and treadmill walking at 5.6 km per hour.

Results: as indicated in the table below, 30 minutes of participation in Hatha yoga resulted in a maximum heart rate of only 105bpm and a total energy expenditure of 67 kcals (for 30 minutes), far below that of walking at a slow/moderate speed on a treadmill.

Variable	Resting in a Chair	Yoga Routine	Treadmill walk at 5.6km/h
VO ₂ (ml/Kg/min)	3.59	7.59	16.17
Kcals/min	1.07	2.23	4.76
HR (bpm)	85	105	133

The authors concluded that, based on their findings, Hatha yoga may be too low of an intensity to provide a training stimulus for improving cardiovascular/aerobic fitness (based on the American College of Sports Medicine recommendations that fit adults should exercise at 65 to 90 per cent of predicted maximal heart rate).

Interestingly, the authors also investigated the differences between 'no sun' salutation and 'sun' salutation. The sun salutation had a significantly higher energy expenditure and peak heart rate, much closer to that observed during the treadmill walking.

Variable	No sun salutation	Sun salutation
Kcals/min	2.28	3.76
HR (bpm)	103	123

Pros: It's important for health enthusiasts to understand the benefits associated with various types of exercise. Although the yoga was strenuous, clearly, flexibility was the primary outcome. And although this study found no improvements in aerobic fitness, a recent study found significant benefits in blood pressure and other indices of cardiovascular disease (Innes et al., 2005, *American Board of Family Practitioners*).

Cons: most yoga classes are longer than 30 minutes duration. It would also have been interesting to compare different forms of yoga.

'Moderate exercise may improve cardiovascular risk factors, life expectancy'

Authors: MedScape Medical News (17 November, 2005)

Source: www.medscape.com (free)

There are those of us who exercise for weight loss, improved muscle strength, improved aerobic capacity, or stress management, but what about those of us who exercise to live longer?

MedScape news (from www.WebMD.com) has reported interesting findings published late last year from the *Archives of Internal Medicine*, which found that walking at either a 'hard intensity' or 'high frequency' resulted in improved cardiovascular risk factors. A second study suggested that life expectancy can also be improved by moderate and high intensity exercise in those individuals who are 50 years of age and older. Put simply, some people can live longer by exercising – what a great idea!

In the first study, approximately 500 sedentary adults

(mostly women) were randomised into five groups (4 exercise, 1 GP advice only). The exercise groups participated in 30 minute walking sessions at one of the following:

- Moderate intensity and low frequency (ModI-LowF)
- Moderate intensity and high frequency (ModI-HighF)
- Hard intensity and low frequency (HardI-LowF)
- Hard intensity and high frequency (HardI-HighF).

NB: moderate intensity ~ 45 to 55 per cent heart rate zone; high intensity ~ 65 to 75 per cent; low frequency was 3 to 4 days per week; high frequency was 5 to 7 days per week.

After six months, the maximum aerobic capacity (VO₂max) increased in both the 'HardI-LowF', 'HardI-HighF', and 'ModI-HighF' groups. Compared with the GP advice only group, the HardI-HighF had significant improvements in HDL cholesterol (good cholesterol) and the total cholesterol to HDL ratio.

After 24 months, the VO₂max remained significantly higher in the 'hard intensity groups.' Surprisingly, there was no significant benefit found in the HDL though. The authors commented 'Exercise counselling with a prescription for walking at either a hard intensity or high frequency resulted in long term improvements in cardiorespiratory fitness. More exercise or the combination of hard intensity plus high frequency may provide additional benefits (including greater fitness and improved cholesterol levels).'

Based on these findings, the authors recommend that 60 to 90 minutes of brisk walking per week can improve cardiorespiratory fitness in adults.

The second study involved construction of life tables based on three levels of physical activity (low, medium, and

high) in populations aged 50 years and older. They found, compared with men with a low physical activity level, those with moderate and high physical activity levels had 1.3 and 3.7 years more in total life expectancy, respectively (also 1.1 and 3.2 years lived without cardiovascular disease). For women, the differences were an additional 1.5 and 3.5 years in life expectancy and 1.3 and 3.3 more years without cardiovascular disease.

Pros: interesting to report on additional 'life years' and 'extended cardiovascular disease-free life years' from regular participation of exercise.

Cons: the authors did not report on risks associated with older individuals exercising at higher exercise intensities. ♦



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