GIH THE SWEDISH SCHOOL OF SPORT AND HEALTH SCIENCES

Exercise dependency is it good or bad?

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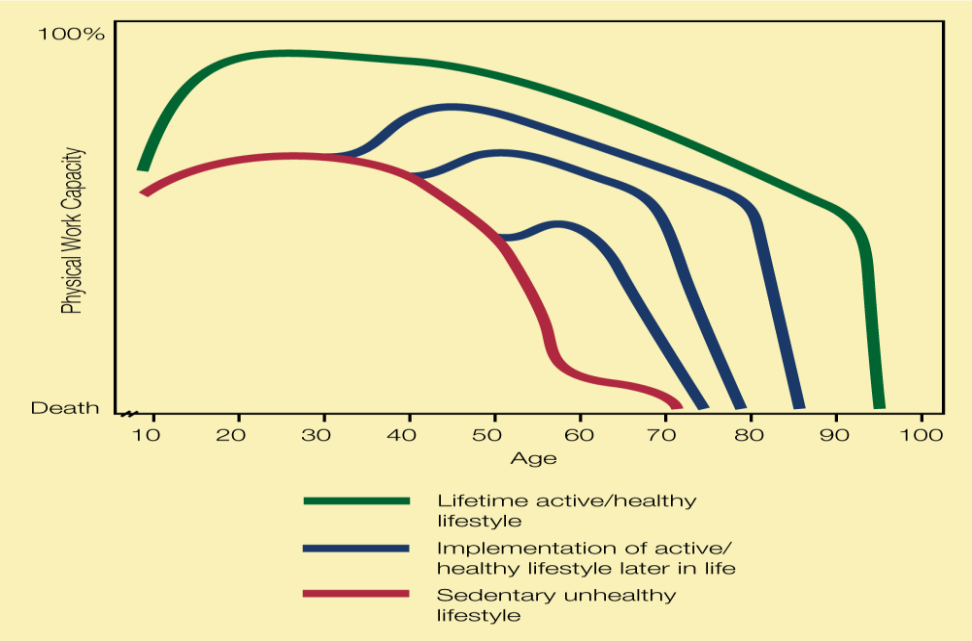
Biologically humans are hunters and herders and closely related to the monkey.

Deaths all causes

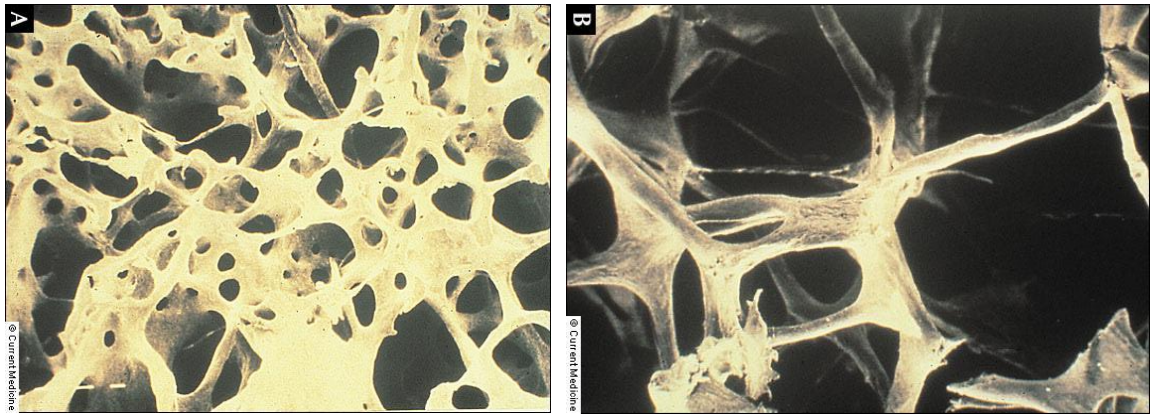
- Lowered risk of early death in the next 5 years if:
  - 65% becoming physically active
  - 50% stop smoking
  - 15% weight loss
  - 15% decreased S-cholesterol
- 30 minutes of walking is enough



Osteoporosis

Increased risk since the 60this – 300% due to

- older population and **decreased physical activity**
- Increased risk of fractures



Exercise dependency

Definition

- negative psychological experience when not exercising
- positive psychological experience when exercising
- exercising even when not appropriate due to physiological or social hinders

Clinical signs

- Reoccurring sports injuries
  - Achilles tendinitis
  - Knee pain
  - Stress fractures

Exercise dependency

Diagnostic criteria (Coverley Veale)

- Stereo type training at least once a day
- Training is prioritized before everything else
- Increase tolerance for training
- Withdrawal symptoms when not training
- Subjectively conscious about the exercise dependency
- Quick return to exercise after a period of rest
- Accompanying signs
  - Continues training despite of illness
  - Self induced weight reduction

Table 1 Exercise addiction inventory and individual factor loadings using principal component analysis

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Factor loading	Addiction component
Exercise is the most important thing in my life	1	2	3	4	5	0.754	Salience
Conflicts have arisen between me and my family and/or my partner about the amount of exercise I do	1	2	3	4	5	0.610	Conflict
I use exercise as a way of changing my mood (e.g. to get a buzz, to escape, etc.)	1	2	3	4	5	0.800	Mood modification
Over time I have increased the amount of exercise I do in a day	1	2	3	4	5	0.742	Tolerance
If I have to miss an exercise session I feel moody and irritable	1	2	3	4	5	0.801	Withdrawal
If I cut down the amount of exercise I do, and then start again, I always end up exercising as often as I did before	1	2	3	4	5	0.762	Relapse

The exercise addiction inventory: a quick and easy screening tool for health practitioners M D Griffiths, A Szabo, A Terry Br J Sports Med 2005;39:e30

Exercise dependency

Frequency

- 17% strong
- 46% mean
- 37% week
- Dancers higher - than runners
- Body builders
  - If single more often

Type of patient

- Man
- Around 30 years of age
- Controlled/Disciplined
- Not a risk taker
- Exercising to decrease stress
- Exercising for health*
- Exercising for weight loss*
- Performs exercise for mood stabilization and self-esteem*

*In Europe and US

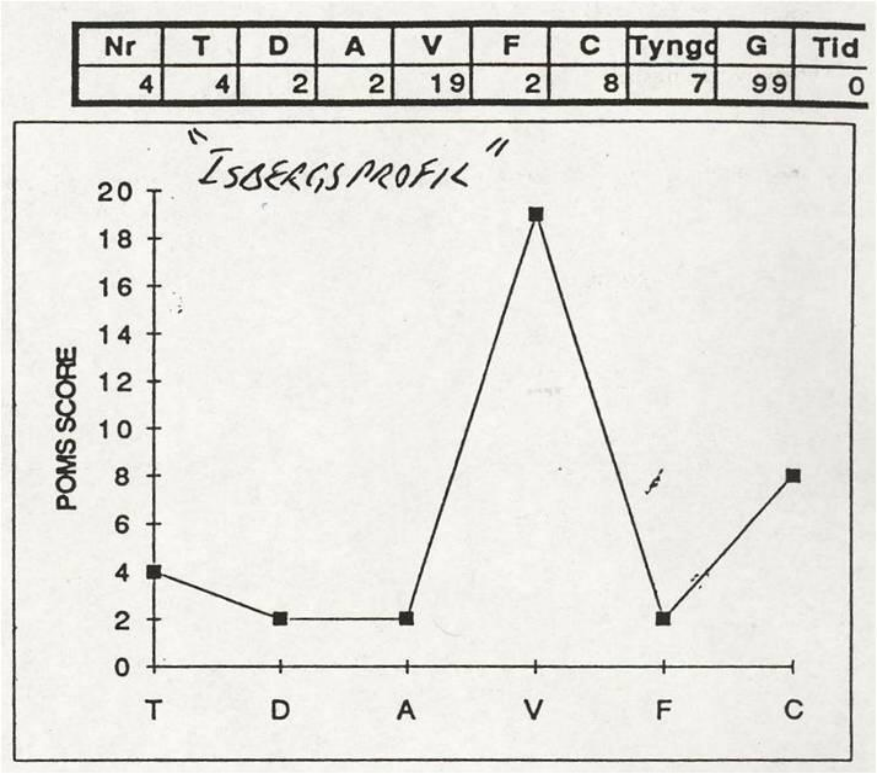
Exercise dependency

Athletes are characterized with

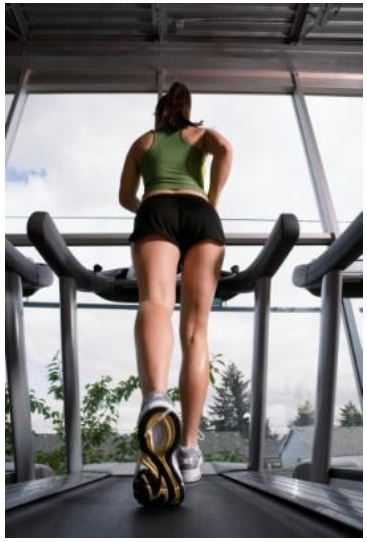
Profile Of Mood States

- Low frequency of tension
- Low frequency of depression
- Low frequency of anger
- Low frequency of fatigue
- Low frequency of confusion
- High score on vigor

- And low Global POMS



Exercise dependency



Runners high

- Spin out effect
- 60k/w running during at least 6 months
  - 93% experience Runners high after.
  - 56% describes euphoria and a feeling of trans
- Half as many experience Runners High during competition as during practice

Exercise dependency

Tapering periods

- Mood disturbances
- Increased sensitivity and irritability
  - POMS – inversed profile
    - High degree of tension, depression, confusion, fatigue and anger
    - Low degree of vitality
- Two different models for explanation
  - With drawl effect from endorphins
  - Runner return to their normal state of affective disorder

Endorphin

Was found1973 and their receptors in the brain and other parts of the body

Different types of endorphins

- Present in
  - GI-channel,
  - medulla oblongata,
  - medial thalamus,
  - limbic system
  - Dorsal horn of the medulla

- Effects
  - Decrease bowel motility
  - Pain relief - sensitivity
    - The effects lasts many hours
    - beta-endorphin 10 times stronger than morphine
  - Behavior control?
  - Motor control?
  - Breeding and circulation
- Has addictive effects
- Released in relation to ACTH part of the cortisol regulation.

Endurance - endorphin

Running

- At 60% - 1 hour no change
- At 80% - 30 min increase
- 1,5 times higher after a treadmill test
- 2,2 - 4 times higher after a marathon
- Trained – Untrained
  - Same at same relative level

Cycling

- At 40-60% of max no increase
- At 80% of max – significant increase
  - Related to lactate
- Trained – Untrained
  - Same at same relative level
- Ramp work until fatigue
  - Change after

Age

- No decrease with age
  - At rest
  - After exercise
- Similar mood changes as young

High intensity exercise

Trained

- 3 min at 100% VO2
  - At rest same
  - Increase
- At 110%
  - Further increase
- 30s supra maximal
  - Increase
  - Related to lactate
- Anaerobic exercise
  - Increase
  - Related to lactate

Untrained

- 3 min at 100% VO2
  - At rest same
  - Increase
- At 110%
  - Further increase
  - Less than trained

Ramp work

- Test of maxVO2
  - Increase simular to a marathon
- Bycycle test at maximal power
  - Increase
- Running - 2 -10 times higher
- Intervall training
  - Increase

Strength training

Early studies

Males

- 10 RM
  - No increase/Increase
  - 1 min rest - Increase
- Free weights
  - No increase

Females

- Free weights
  - No increase

Muscle Appearance Satisfaction Scale for Dysmorphia symptoms

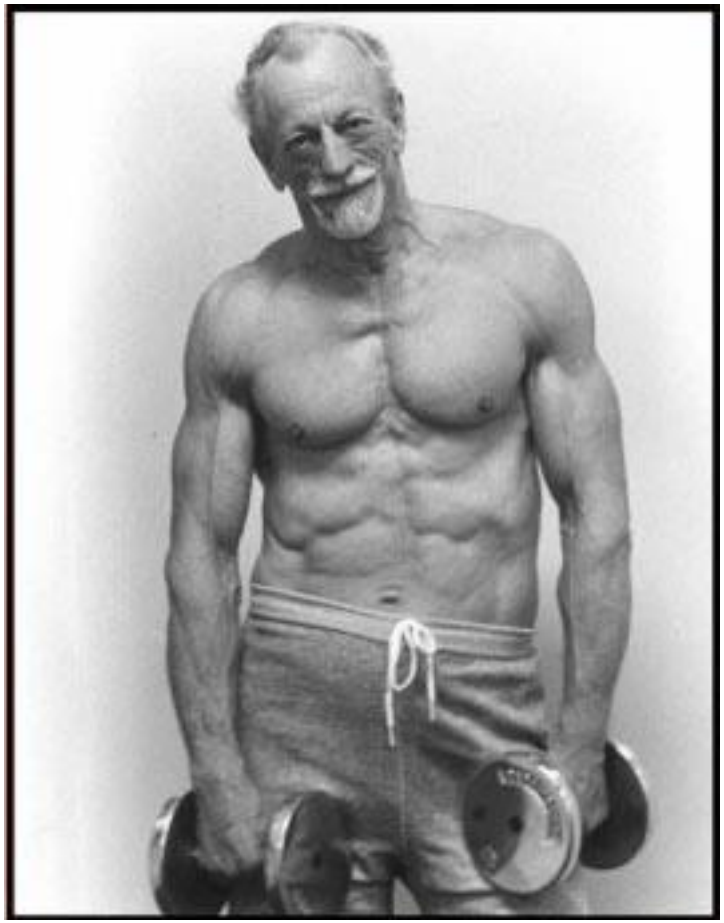
- Bodybuilding Dependence,
- Muscle Checking,
- Substance Use,
- Injury, and Muscle Satisfaction

Risk factors for illicit anabolic-androgenic steroid use

- Conduct disorder and
- Body-image concerns

Training dependency and addiction

- Prevalence in fitness rooms
  - 42% exercise dependency
    - Spent 2.1 hours/day in the fitness center
    - 3.5 days/w
    - Smoked less
    - Equal alcohol consumption
    - 63% compulsive buying
    - Bulemia 70%
    - Used computers more
- Drive for muscularity
  - Body builders more dependent



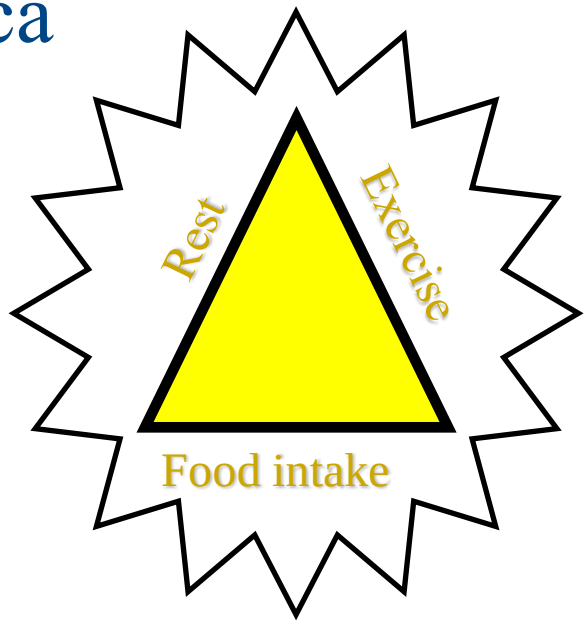
Gender differences

- Exercise dependency
  - Marathon runners
    - Women more addicted
- Endorphin
  - Marathon runners
    - Male greater increase
    - Females higher baseline
  - Other sports
    - Equal increase
  - Amenorrhea greater increase

Addiction for endorphine

- Is shown in animal studies
- Addiction = tolerans development
  - Decreased numbers of receptors
- Training dependency
  - Need for higher amount of training
  - With drawl symptoms
- Short intense work
  - Related to lactate formation?
- Long lasting (50 min) low intensive (ca 70% av max)

Anorexia athletica



Physical activity – energy expenditure

- Intensity
- Time

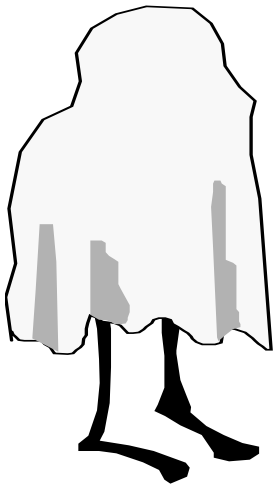
Physical activity – increase food intake

- Harder for women?
- Body image
- Hormonal differences
- = ***negative energy balance***

The female athletic triad

- Low body weight
- Menstrual disturbances
- Low bone mass

Increased risk for stress fractures?



Heavy training – decreased food intake

Blood glucose ↓

Body fat ↓
Glycogen ↓

Body Weight ↓

Muscle degration ↓

Physical performance ↓

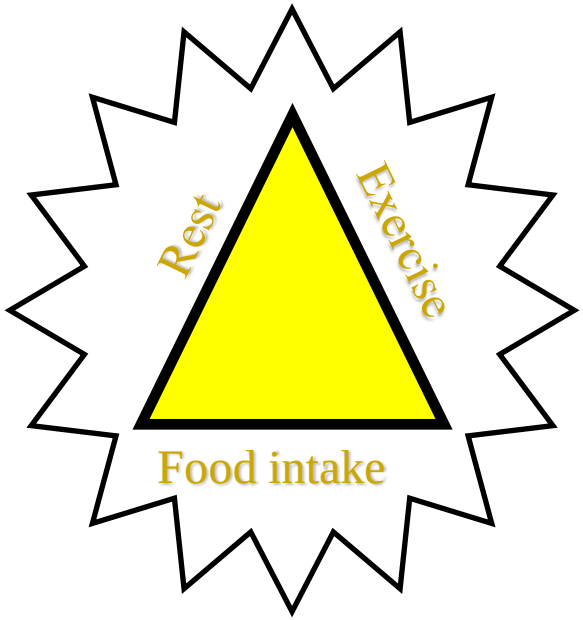
Cortisol ↑

Endorphine ↑

POSITIVE PHASE

Endorphine Dependency ↑

”Reality crash” Psychological symptoms



Other Candidates

- Epinephrine,
- Serotonin,
- Dopamine.
- Endocannabinoids
- Anandamide

Endocannabinoids

- Necessary for cognitive improvements due to exercise
- Involved in the reward system of exercise and eating sweets
- Nock out mice ran 30-40% less than regular mice.
- Shows motivation and reward for running more than mood change,
- Not most likely to cause runners high

Conclusion

- Exercise dependency excist
- Is both positive and negative
- Gives an increased mood
- Can result in runner’s high
- Associated with lowered blood preassure
- Increase pain threshold
- Decrease fatigue
- Better cognitive functions

Conclusion

- With drawl effects
- Disregard physical symptoms
- Pathology
  - Endorphin dependency
  - Other dependencies
  - Affective disorder
- Related to anorexia athletic
- Related to overtraining

So is it GOOD or BAD to be exercise dependent?

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Tack!