

## Exercise Psychology

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## Types of Physical Activity (PA)

- Aerobic vs. Anaerobic (Intensity)
- Leisure-Time (LT) vs. Work-Related (WR)
- Accumulated vs Longer Duration Episodes

## Aerobic Exercise

- Continuous and moderately intensive exercise of the heart and lungs
- Primarily strengthens the cardiovascular-respiratory system

## Anaerobic Exercise

- Isokinetic/Isometric/Isotonic
- Muscular fitness
  - Strength - exert force
  - Endurance - sustain muscular activity
- Flexibility
  - ability to use joints and muscles through full range of motion

## Exercise Prescription

- Periodization
- Overloading
- Progression

## FIT

- Frequency, Intensity and Time (duration)
- Intensity
  - %VO<sub>2</sub> max - aerobic
  - % 1Rep Max - anaerobic

## Suggested Benefits

- Enhanced Mood
- Higher Self-Esteem
- Higher Self-Efficacy
- Better Cognitive Functioning
- Decreased Anxiety, Neuroticism & Stress
- Increased Stability and Stamina  
(Plante, 1993; ISSP, 1992)

## Effects of Exercise on Depression

- 90% of studies report antidepressant effects
- Results from Pendleton, et al., 2001
  - 75% depressed pretreatment; 12% Severe
  - 29% depressed post treatment; 2% Severe
- Unrelated to intensity or duration
- No difference between types of exercise

## Effects of Exercise on Depression

- Aerobic vs Anaerobic
  - No Differences between types of exercise
  - Unrelated to changes in cardiorespiratory fitness.

## Effects of Exercise on Anxiety

- Reductions in trait anxiety associated with programs longer than 10 weeks.
- Duration of state anxiolytic effect 4-6 hrs
- More benefit from aerobic exercise, though anaerobic studies are few.
- Unrelated to intensity or duration
- Similar in effect to other non-drug treatments (time-out hypothesis)

## State vs. Trait Anxiety

- Effects are ephemeral
- Does it change character?
- Regular PA required to experience benefits on an ongoing basis.

## Less evidence for Improvement in Cognitive Functioning

- Math, acuity, reaction time

## Recreational vs Work-Related

- Mental Health Benefits from Recreational PA
- No Mental Health Benefits from Work-Related PA

## Frequency, Intensity & Time

- Questions regarding dose-response
  - F.I.T.
  - Physical benefit
    - do we know what's adequate?
    - sketchy on what's minimal or optimal
  - Psychological benefit
    - many dose response questions

## Evidence for Direct Benefits is Largely Correlational

- Many of the studies have methodological problems of varying types
- Physical activity and mood measured at the same time
- Cause and effect not shown.
- Some studies are experimental and address cause and effect

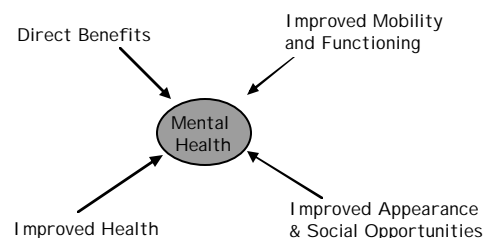
## Possible Mechanisms

- Social benefits
- Leisure effects
- Feelings of accomplishment, control
- Increased sense of mastery & self-efficacy
- Time-out hypothesis, distraction
- Suggestion, placebo
- Biological pathways

## Mechanisms

- Some suggest biological pathways:
  - increased concentrations of neurotransmitters
  - increased concentrations of endogenous opiates
  - decreased concentration of stress hormones
  - increased body temperature
- Evidence suggests non-physiologic mechanisms.

## Benefits of Physical Activity



## Mental Health Benefits Population Specific?

- Most studies use adults
- “Mentally ill” benefit most
  - More room for improvement
- Benefits to “apparently healthy” not clear
  - Measurement issues
    - Scores in normal range: “healthier?”
  - Subjective feelings of improved well-being

## Qualifications

- Mild to moderate **Unipolar Depression** w/o psychotic or melancholy features: treatment but not prevention
- Generalized Anxiety and simple phobia: may be effective but studies are few.
- Evidence of efficacy with other types of mental disorders is equivocal

## Conceptual Considerations

- Any type of LTPA may possibly have benefits
- Intensity and duration are not important factors

## Functional Exercise

- Lost to industrial revolution
  - farming
  - walking
- Useful for caloric expenditure (obesity)
- Is it useful for mental health benefits?

## LT or WR?

- Are these LT or WR PA?
  - Walking to work
  - “Taking the stairs”
  - Mowing the lawn
  - Gardening

## Definition of Obesity

- BMI
- Waist Circumference

## Weight Classification - NIH

	BMI
<b>Underweight</b>	< 20
<b>Normal Wt</b>	20 - 24.9
<b>Overweight</b>	25 - 29.9
<b>Mild Obesity</b>	30 - 34.9
<b>Mod Obesity</b>	35 - 39.9
<b>Sev Obesity</b>	> 40

## Waist Circumference - RACGP

	Fem	Male
Increased Risk	>80cm	>94cm
Hi Risk	>88cm	>102cm

## Classification of Disease Risk Based on BMI & Waist Circumference

BMI , kg/m <sup>2</sup>	Men <102cm Women <88cm	Men >102cm Women >88cm
< 18.5		
18.5-24.9		
25-29.9	Increased	High
30-34.9	High	Very high
35-39.9	Very high	Very high
>40	Extremely high	Extremely high

## Why Treat Obesity?

- It increases morbidity
- It is increasing in prevalence

## Suffering Caused by Obesity

Hypertension	Sleep Apnea
Dyslipidemia	CHD
Osteoarthritis	Stroke
Respiratory probs	T2 diabetes
Gallbladder disease	
Endometrial, breast, prostate, and colon cancers	

## Additional Suffering Related to Obesity

- Poor mobility
- Lowered Self-esteem
- Shame
- Societal Discrimination
  - including medical establishment
- Relationship problems\*

## Definition of Successful Weight Loss

- >5% of initial body weight, or a reduction in BMI by 1 or more units, and maintaining the loss for at least 1 year.

Weighing the Options. (1995). Institute of Medicine.

## Rationale for Target of >5%

- "Most obese individuals cannot reduce to ideal weight."
- "Even for those who manage to lose a large amount of weight, the great majority cannot maintain the loss."
- "Patients do not need to reduce to ideal weight to improve their health"

(Anderson & Wadden. (1999). Arch FamMed)

## Benefits of "Success" as Defined

Hypertension (A)	Sleep Apnea
Dyslipidemia (A)	CHD
Osteoarthritis	Stroke
Respiratory probs	T2 diabetes (A)
Gallbladder disease	
Endometrial, breast, prostate, and colon cancers	

Clinical guidelines on identification, evaluation, and treatment of O&O in adults. (1998). NIH

## Benefits of "Success" as Defined

- Poor mobility
- Lowered Self-esteem
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- Societal Discrimination
  - including medical establishment
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## Expectations

- The best behavioural and pharmacological treatments produce weight-loss outcomes of 5-10%.
- Obese patients consider such outcomes as less than disappointing.
- 20 - 30% is often desired
- High pretreatment weights related to most "unrealistic" expectations.

## National Weight Loss Registry

- A database of people successful at maintaining a weight loss.
- Participants must have lost at least 13.6 kg and have maintained that loss for at least 1 year.

## Weight Loss Registry

- 3000+ people
- Average weight loss was 32kg and participants have kept it off for an average of five and a half years,
- 2/3 were overweight as children and 60% family history of obesity.
- 50% lost weight on their own without any type of formal program or help.
- Diet & Exercise

## Weight Loss Registry

- Three-quarters who kept weight off exceeded the minimum activity guideline of 30 minutes moderate activity a day at least 5 times a week. 400kcal/day
- Regular meals, eating a variety of foods, smaller portions and lower fat foods. 1400kcal/day

## Weight Loss Registry

- About 1/2 had professional assistance or a formal program and the other half did it on their own.
- Self-monitoring
  - Weekly weighing
  - Counting fat grams or calories or planning menus by the week

## Weight Loss Registry

- Cathartic Event
  - Men: medical illness
  - Women: emotionally based event

## Weight Loss Registry

- Over 3/4 of the people were motivated by a "trigger event"
- 1/3 said medical problems such as low back pain, poor sleep, and fatigue were triggers
- Others said emotional, lifestyle, or ongoing discontent, or "just deciding to do it" was their trigger to successful attempt

## Weight Loss Registry

- Most had tried several times to lose weight, without much success.
- They said the difference when they succeeded was that they were more motivated by social and health reasons to change their behaviors.

## Weight Management is an Unnatural Act

- Optimized for an environment that no longer exists
- Abundance of high calorie, highly palatable food
- Low levels of physical activity required to “catch it”
- Once we hunted food, now food hunts us

## Etiology

- Natural predisposition
  - Optimal Foraging Theory
- Environment
  - changes over last 10,000 years
  - Pimas

## Optimal Foraging Theory

Glaucous-winged Gulls maximize the following ratio in their foraging behaviour:

$\text{Energy Content} / (\text{Search \& Handling Time})$

## Environmental Changes

- Transportation
- Abundance of delicious, calorie dense, food
- Communication, Marketing and Advertising

## Environment/Genetic Interaction

- In balance and harmony with nature
- Energy efficiency is no longer adaptive

## The North American PI MA Indians

- Common genetic pool
- Arizona Pimas
  - Sedentary
  - Fatter than any other group in the world
  - Rate of DM is 50% in adults >35yrs
- Mexican Pimas
  - They eat slightly more
  - 20 hrs mod-hard physical labor/wk
  - They are *THIN* and have a normal rate of DM



## Exercise Prescription for Obesity

- Clarify Goals: fitness vs weight loss
- Adjust exercise F.I.T. accordingly
- Focus on adherence:
  - feedback; enjoyment
  - meaning/motivation/purpose
  - plan for relapse
- Self-monitoring
- Integrate with lifestyle and other treatments

## References for Weight Management

- Foreyt, J.P. & Pendleton, V.R. (2000). Management of obesity. *Primary Care Reports*, 6(3), 19-30.
- Bray, G.A. (1998). *Contemporary Diagnosis and Management of Obesity*. Newton, PA: Handbooks in Healthcare.
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## Other Major References

- National Institutes of Health. (1998). Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity.
- Institute of Medicine. (1995). *Weighing the options: Criteria for evaluating weight management programs*.

Thank You!

