



NORWEGIAN SCHOOL OF SPORT SCIENCES

Eating Disorders, Exercise and Sport

- from abuse to health
- to train or not to train

Nordic Conference on Eating Disorders, 23.9.2016

Bratland -Sanda & Sundgot-Borgen

What do we know?



- Although exercise is an effective intervention for many psychological health issues, it has often been overlooked as a potential adjunct to ED treatment.
- Two-thirds of the specialized UK and Scandinavian ED units use non-manualized guided PA, but generally, PA is rarely used in clinics due to a fear of reinforcing excessive exercise
- Compulsive or excessive exercise is often one of the symptoms in persons with EDs, and is associated with more severe psychopathology, poorer treatment outcome and higher risks of relapse.
- Inactivity is common among people with BED.



What do we know?

- No specific exercise recommendations for the different diagnosis
- A high prevalence of athletes are suffering from eating disorders
- Health should be considered a priority for athletes and risk assessment and return to play guidelines are developed





NORWEGIAN SCHOOL OF SPORT SCIENCES

Eating disorders and exercise – from abuse to health

Solfrid Bratland-Sanda, PhD

NEDS Helsinki, 23.09.16

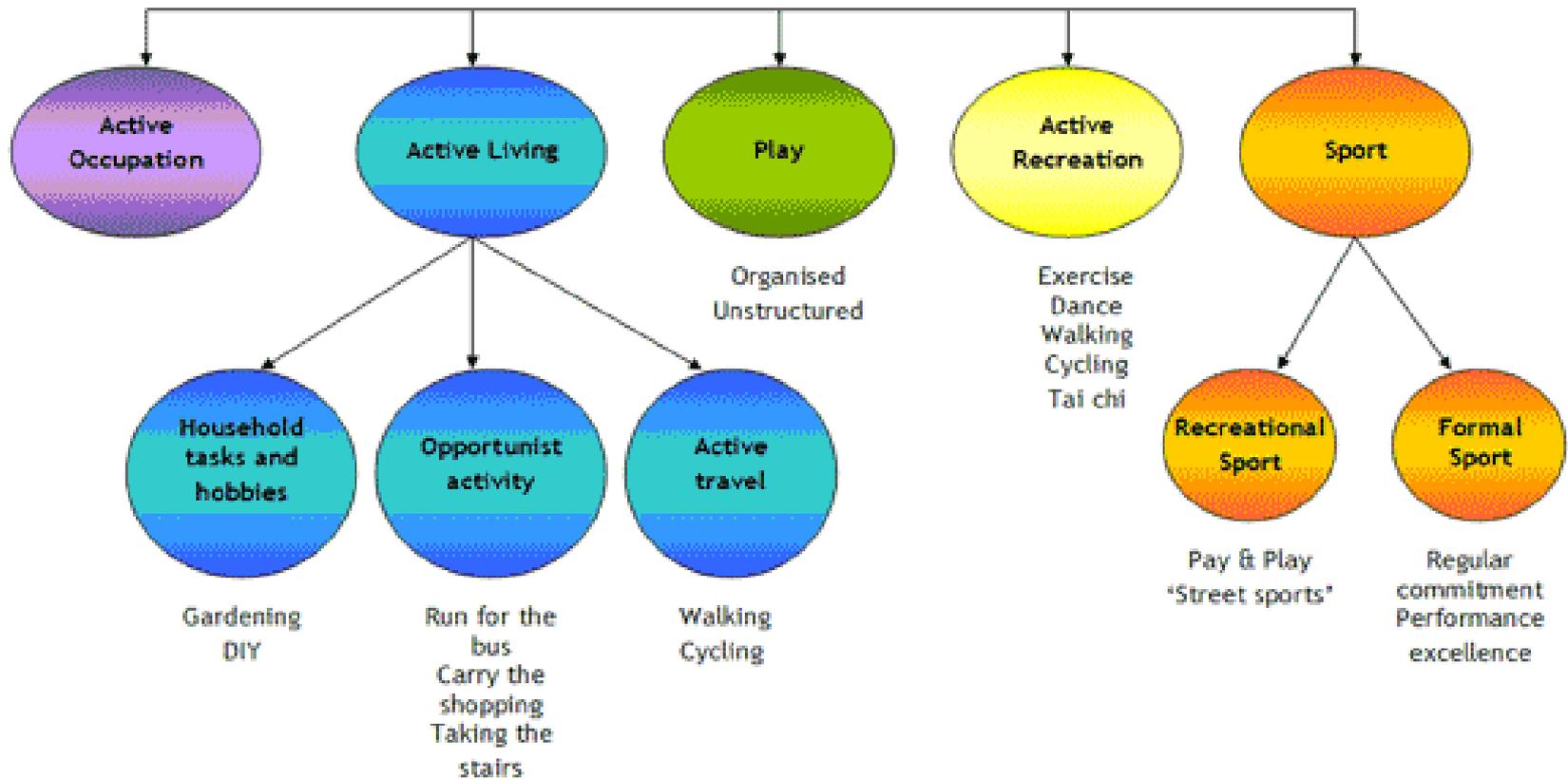
Outline

1. What is physical activity and exercise?
2. When does exercise become pathological?
3. Why do we need to take pathological exercise seriously?
4. How do we deal with pathological exercise?
5. How can exercise be used as part of treatment for various eating disorders?

1: What is physical activity and exercise?

- Physical activity:
 - All movement induced by skeletal muscle that increases metabolism above resting level» (Caspersen et al., 1985)
- Exercise
 - Regular physical activity performed with the intention of improving performance, physical fitness and/or health (Bouchard et al., 1994)
- Do we and our patients share the same definitions of physical activity and exercise?
 - «I'm not physically active – I only go for walks» (Bratland-Sanda et al., 2010)

Physical activity spectrum



Recommendations (ACSM)

- Recommendations for maintaining health
- Separate recommendations for
 - prevention of weight gain
 - weight loss
 - pregnant

CHILDREN (Under 17)



ADULTS (18-64 years old):



OLDER ADULTS (65 years old & older):

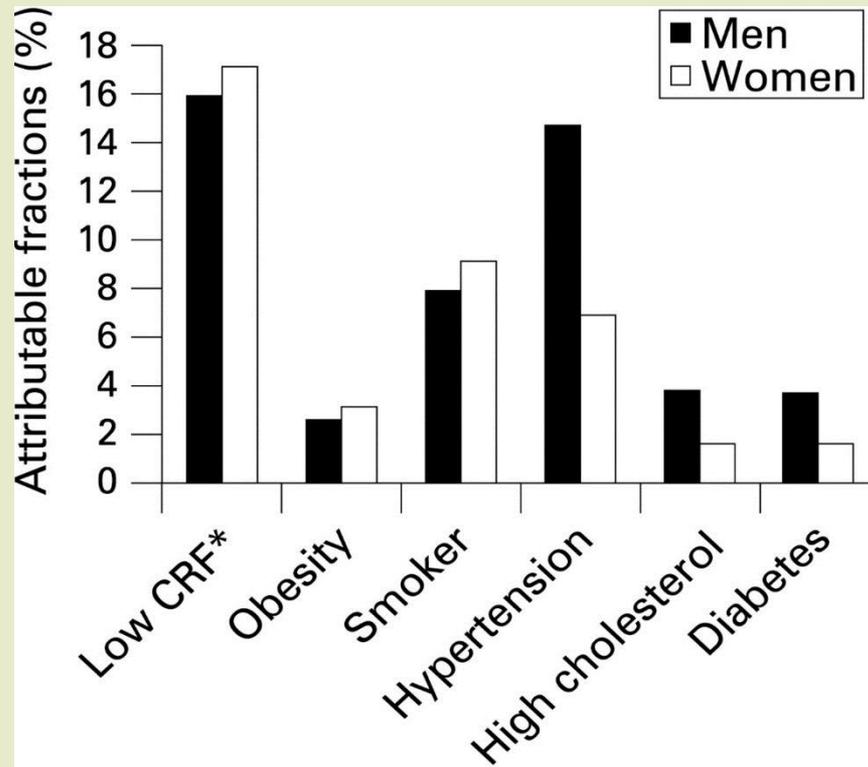


•Attributable fractions (%) for all-cause deaths in 40 842 (3333 deaths) men and 12 943 (491 deaths) women in the Aerobics Center Longitudinal Study.



Physical inactivity: the biggest public health problem of the 21st century

Steven N Blair



•Steven N Blair Br J Sports Med 2009;43:1-2

General benefits of physical activity

- Acute and chronic effects
 - Cardiovascular
 - Musculoskeletal
 - Brain
- Prevent various non-communicable diseases
- Treat various non-communicable diseases
- Improves somatic health in psychiatric patients and mental health in somatic patients

ORIGINAL ARTICLE

Binge-Eating Disorder in the Swedish National Registers: Somatic Comorbidity

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Hunna J. Watson, PhD^{1,2,3}
Andreas Jangmo, MSc⁴
Elisabeth Welch, PhD⁴
Camilla Wiklund, MSc⁴
Yvonne von Hausswolff-
Juhlin, MD, PhD^{5,6}
Claes Norring, PhD^{5,6}
Barry K. Herman, MD, MMM⁷
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Cynthia M. Bulik, PhD^{1,4,8*}

ABSTRACT

Objective: To evaluate associations between binge-eating disorder (BED) and somatic illnesses and determine whether medical comorbidities are more common in individuals who present with BED and comorbid obesity.

Method: Cases ($n = 850$) were individuals with a BED diagnosis in the Swedish eating disorders quality registers. Ten community controls were matched to each case on sex, and year, month, and county of birth. Associations of BED status with neurologic, immune, respiratory, gastrointestinal, skin, musculoskeletal, genitourinary, circulatory, and endocrine system diseases were evaluated using conditional logistic regression models. We further examined these associations by adjusting for lifetime psychiatric comorbidity. Amongst individuals with BED, we explored whether comorbid obesity was associated with risk of somatic disorders.

Results: BED was associated with most classes of diseases evaluated; strongest associations were with diabetes [odds ratio (95% confidence interval) = 5.7 (3.8; 8.7)] and circulatory systems [1.9 (1.3;

2.7)], likely indexing components of metabolic syndrome. Amongst individuals with BED, those with comorbid obesity were more likely to have a lifetime history of respiratory [1.5 (1.1; 2.1)] and gastrointestinal [2.6 (1.7; 4.1)] diseases than those without comorbid obesity. Increased risk of some somatic disease classes in individuals with BED was not simply due to obesity or other lifetime psychiatric comorbidity.

Discussion: The association of BED with many somatic illnesses highlights the morbidity experienced by individuals with BED. Clinicians treating patients with BED should be vigilant for medical comorbidities. Nonpsychiatric providers may be the first clinical contact for those with BED underscoring the importance of screening in primary care. © 2016 The Authors International Journal of Eating Disorders Published by Wiley Periodicals, Inc.

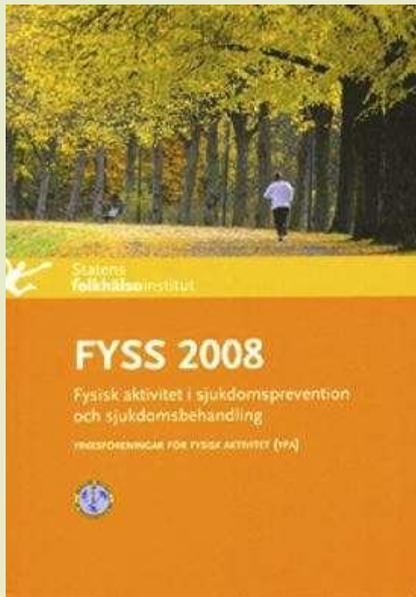
Keywords: binge-eating disorder; gastrointestinal; cardiovascular; physical; metabolic syndrome; somatic; medical comorbidity

(*Int J Eat Disord* 2016; 00:000-000)

v

•(Pedersen and Saltin, 2006)

Handbooks of PA in prevention and treatment of diseases lack recommendations for PA and ED!



•fyss.se



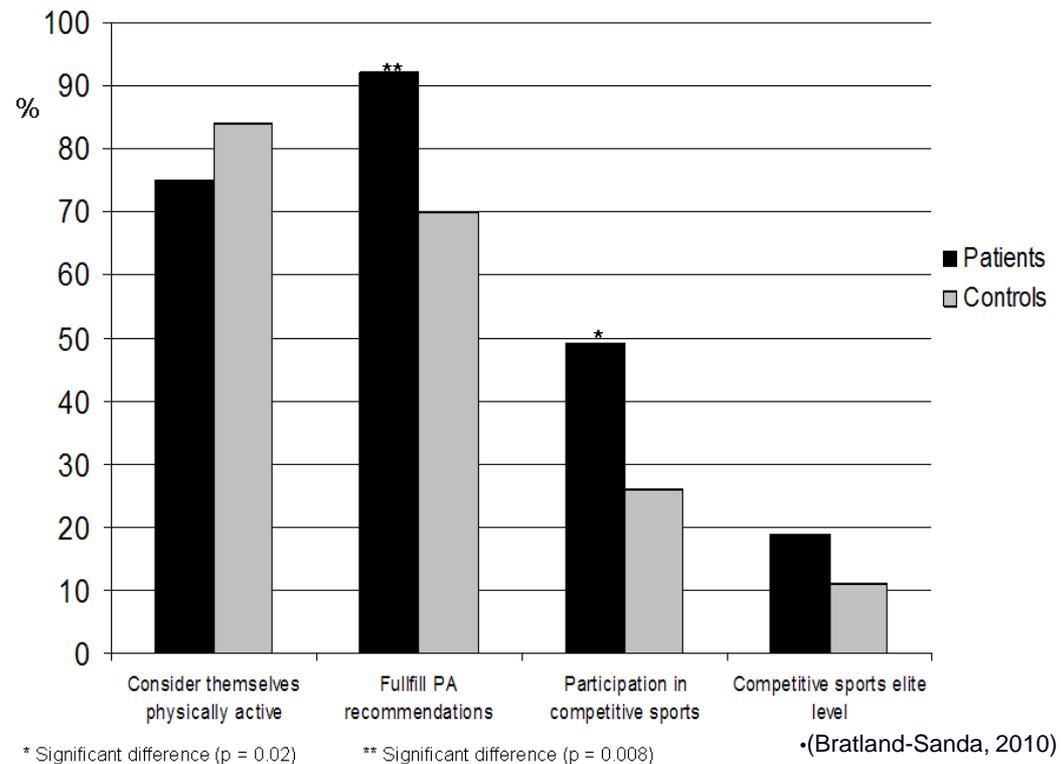
•sundhedsstyrelsen.dk



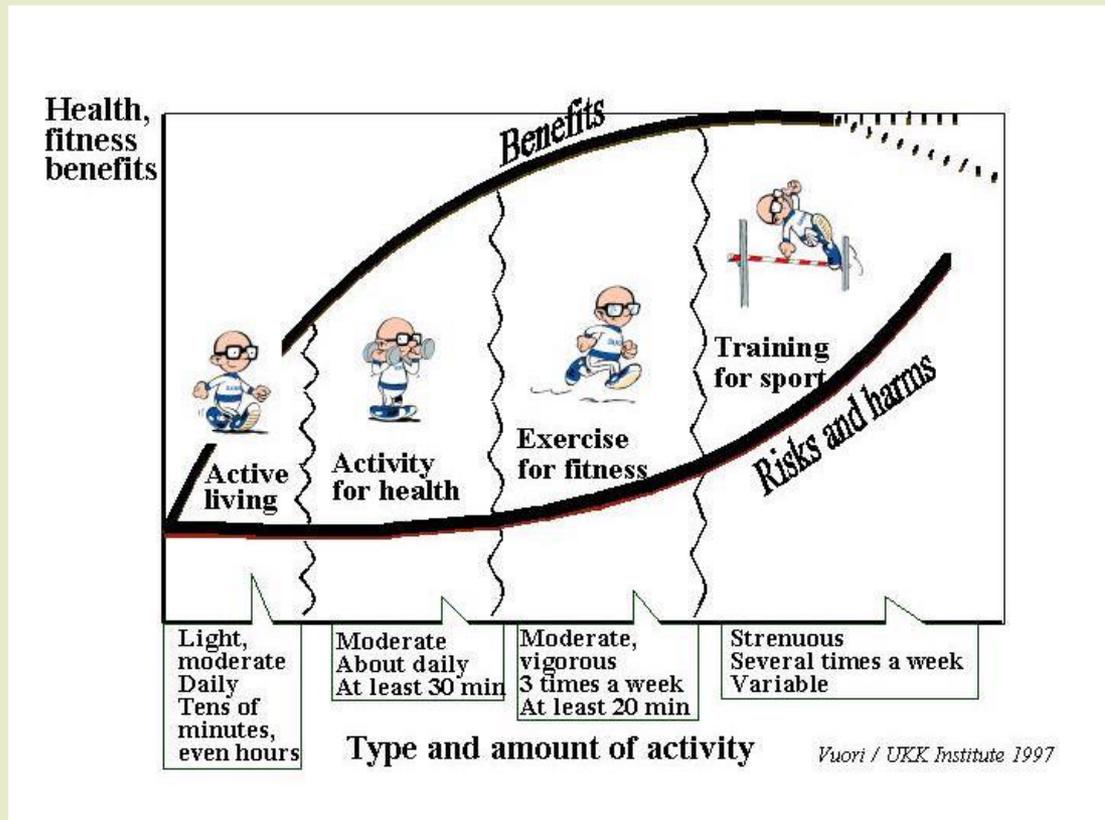
•helsedirektoratet.no

How active are persons with ED?

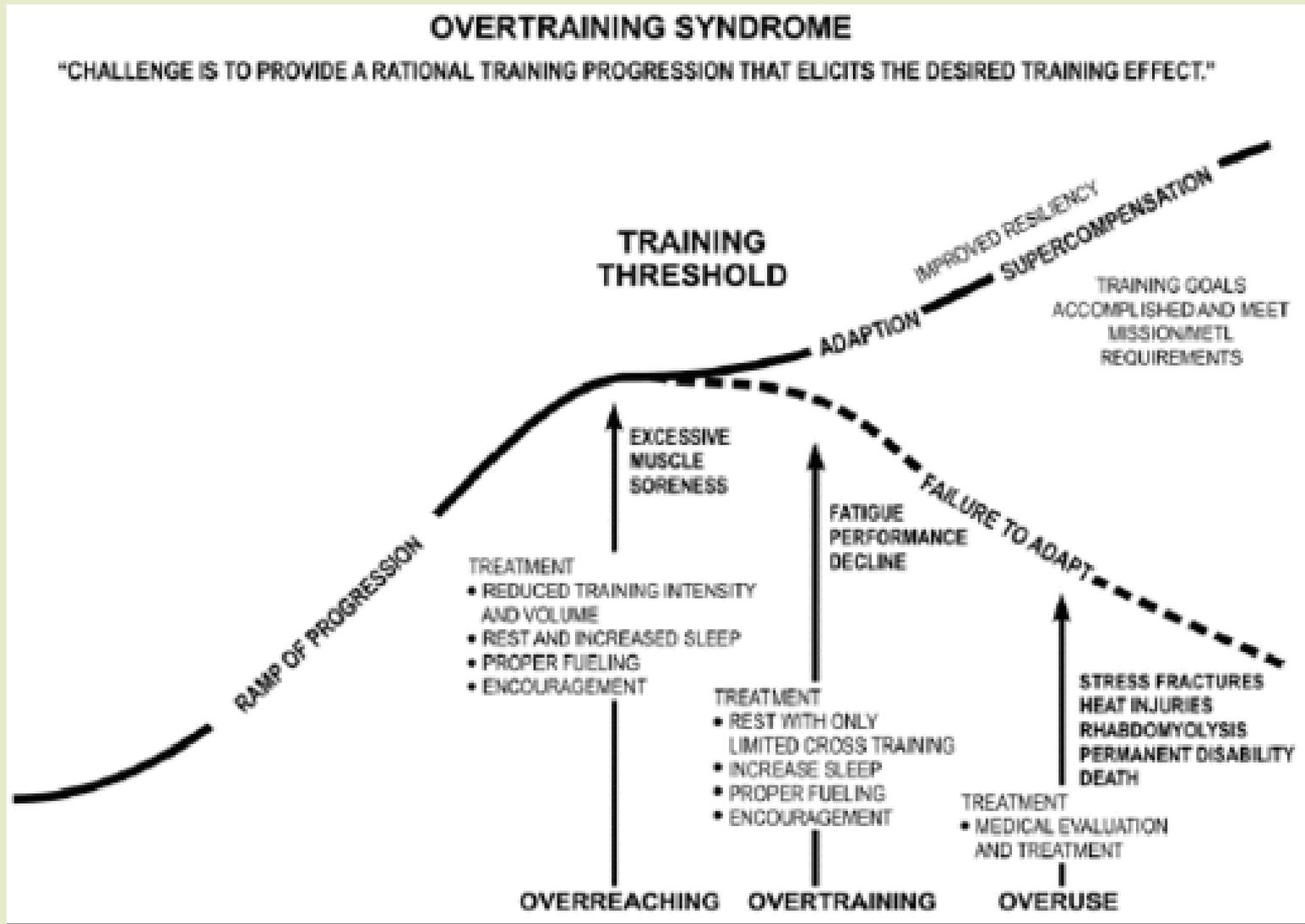
Study	Results
Casper et al. (1991)	AN > Controls
Pirke et al. (1991)	AN > BN = Controls
Davis et al. (1994)	ED > Controls
Bouten et al.(1996)	AN = Controls
Sundgot-Borgen et al. (1998)	AN > BN = Controls
Boyd et al. (2007)	ED = Controls
Hrabosky et al. (2007)	BED < Controls
Bratland-Sanda et al. (2010)	AN = BN = EDNOS > Controls



2: When does exercise become pathological?



Excessive exercise



Compulsive exercise (Meyer et al., 2011)

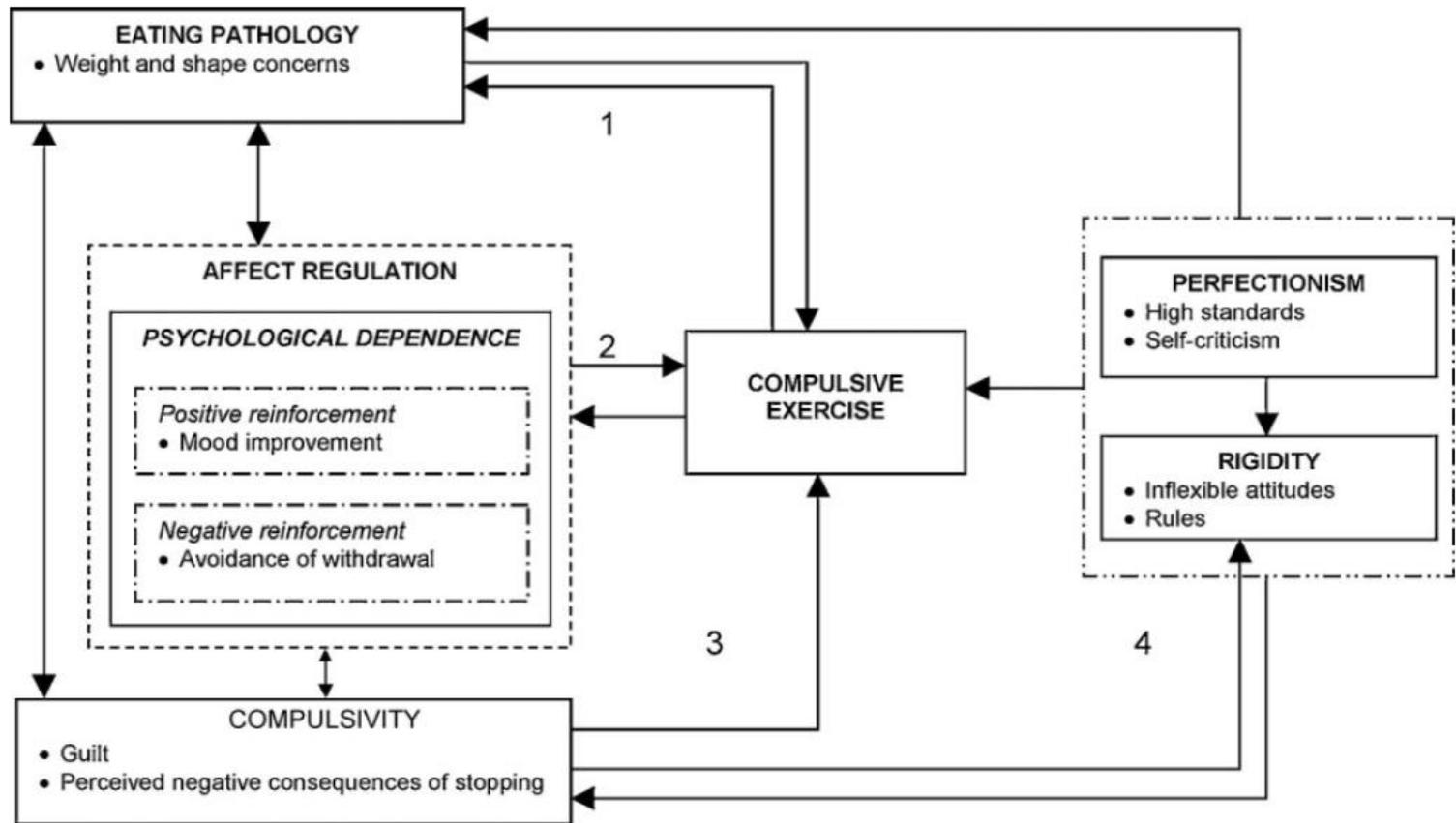
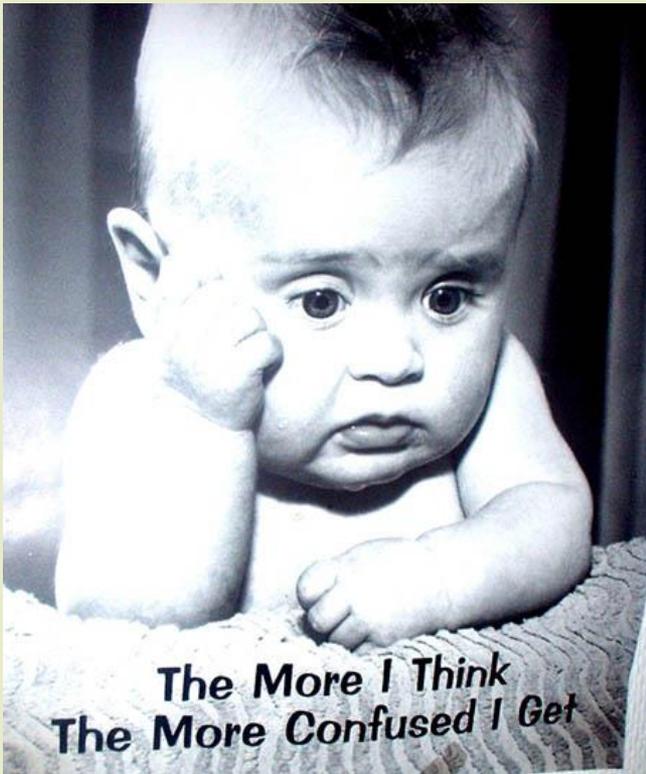


Figure 1 A schematic representation of the maintenance model of compulsive exercise

Exercise dependence

- Maladaptive patterns of leisure time physical activity which lead to uncontrollable excessive exercise behavior with physiological and psychological symptoms
- Suggested criteria involves
 - Physiological symptoms
 - Tolerance (i.e. need for continuously higher amounts of exercise)
 - Withdrawal (i.e. physiological reactions to exercise deprivation)
 - Psychological symptoms
 - Interference with social and occupational functioning
 - Lack of control
 - Continuance
 - Intention effect

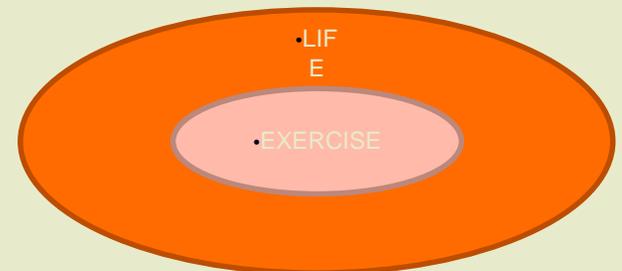
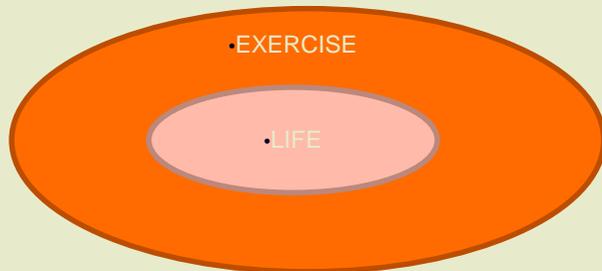
Attempt to explain differences between the terms



- Excessive exercise:
 - Quantitative aspects
 - Too much, varying motives
- Compulsive exercise:
 - Qualitative aspects
 - Need for following rituals, and avoid the discomfort of not following the rituals
- Exercise dependence:
 - Quantitative + qualitative aspects
 - Avoid withdrawal

So... when does the exercise become pathological?

- Recommendations (ACSM): A MINIMUM OF 150 min per week of moderate-to-vigorous intensity PA
- Dedicated vs dependent (Cockerill and Riddington, 1996):



3: Why do we need to take pathological exercise seriously?

↑ ED psychopathology ↓ binge eating episodes, purging episodes, use of laxatives	Brewerton et al. 1995; Davis et al. 1997; Solenberger 2001; Penas-Lledo et al. 2002; Shroff et al. 2006; DalleGrave et al. 2008
↑ general psychopathology (anxiety, depression, OCD)	Davis et al. 1997; Penas-Lledo et al. 2002; Calogero og Pedrotty 2004; Davis og Kaptein 2006; Shroff et al. 2006
↑ treatment duration	Strober et al. 1997; Solenberger 2001; DalleGrave et al. 2008
Impaired treatment outcome	Strober et al. 1997; DalleGrave et al. 2008
↑ Risk of relapse	Strober et al. 1997
Younger age?	Shroff et al. 2006
Lower BMI?	Shroff et al. 2006

4: How do we deal with pathological exercise?

- Cognitive behavior therapy – ongoing studies
 - Loughborough Eating Disorders Activity Therapy Program (EDR 2011)
 - PED-t Norway (<http://nihfakt.blogspot.fi/>)
- Motivational interview - no existing studies
- Adapted exercise (Calogero & Pedrotty, 2004, PED-t Norway)



PED-t at a glance

Therapy based on work by Denise Wilfley

(«Group CBT for BED», Therapist manual 1996):

Monday

45 min strength exercise

60 min nutrition education

Wednesday

45 min interval running

Friday

45 min strength exercise



5: How can exercise be used as part of treatment for various ED?

What weight-lifting can do for a former anorexic

Swapping starving for strength-training

Like 53

Posted Jan 24, 2011



SHARE



TWEET



EMAIL



MORE

I go to the gym three times a week - and I look forward to it!



Physical activity in treatment of ED: effects

- Reduce ED symptoms
- Enhance physical fitness
- Improve weight restoration (AN) and weight reduction (BED)
- Reduce binge eating episodes
- Reduce compulsive exercising
- Reduce symptoms of anxiety and depression
- Improve quality of life

•(Touyz et al., 1993; Levine et al., 1996; Carraro et al., 1998; Thien et al., 2000; Pendelton et al., 2002; Sundgot-Borgen et al., 2002; Szabo & Green, 2002; Duesund and Skårderud, 2003; Tokumra et al., 2003; Calogero & Pedrotty, 2004; Fossati et al., 2004; Chantler et al., 2006; McIver et al., 2009; Carei et al., 2010; del Valle et al., 2010; del Valle et al., 2014)

Exercise in Eating Disorders Treatment: Systematic Review and Proposal of Guidelines

BRIAN J. COOK¹, STEPHEN A. WONDERLICH^{2,3}, JAMES E. MITCHELL^{2,3}, RON THOMPSON⁴, ROBERTA SHERMAN⁵, and KIMBERLI MCCALLUM⁶

¹California State University Monterey Bay, Seaside, CA; ²Neuropsychiatric Research Institute, Fargo, ND;

³University of North Dakota School of Medicine and Health Sciences, Fargo, ND; ⁴Indiana University, Bloomington, IN;

⁵Bloomington, IN; and ⁶The Victory Program at McCallum Place, St. Louis, MO

ABSTRACT

COOK, B. J., S. A. WONDERLICH, J. E. MITCHELL, R. THOMPSON, R. SHERMAN, and K. MCCALLUM. Exercise in Eating Disorders Treatment: Systematic Review and Proposal of Guidelines. *Med. Sci. Sports Exerc.*, Vol. 48, No. 7, pp. 1408–1414, 2016.

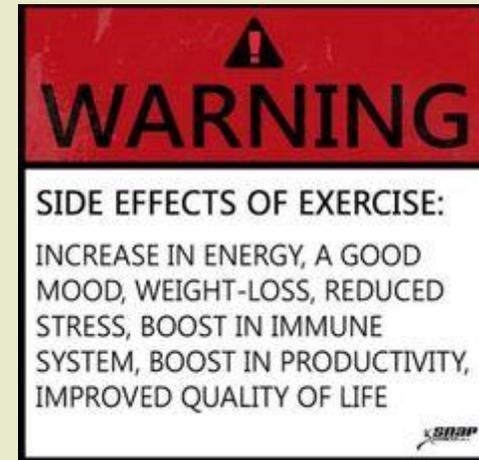
Introduction: Although exercise is an effective intervention for many psychological health issues, it has often been overlooked as a potential adjunct to eating disorder (ED) treatment. Thus, our objective was to summarize the literature by synthesizing themes identified in clinical studies and explicit guidelines or recommendations for the use or management of exercise in ED interventions into a proposed set of guidelines for the use of exercise in ED treatment. **Methods:** A literature search in exercise science, health psychology, and the ED literature was conducted. The focus was to obtain articles that reported on therapeutic effects and/or guidelines for the therapeutic use of exercise in individuals with ED. **Results:** Our review identified 11 core themes describing techniques that have been successful in using exercise therapeutically in ED treatment. These 11 guidelines are as follows: employ a team of relevant experts, monitor medical status, screen for exercise-related psychopathology, create a written contract of how therapeutic exercise will be used, include a psycho-educational component, focus on positive reinforcement, create a graded exercise program, begin with a mode of exercise to the needs of the individual, include a nutritional component, and debrief after exercise. **Conclusion:** This review identifies specific guidelines that may enhance ED treatment outcomes. It is the first to summarize previous successes that may guide the use of therapeutic exercise in some, but not all ED. **Practical set of guidelines for the clinical management and therapeutic use of exercise in ED treatment:** individuals with exercise as a tool for healthy living. **Key Words:** EXERCISE IS MEDICINE, EXERCISE IN EATING DISORDERS, GUIDELINES, LITERATURE REVIEW

TABLE 1. List of themes in therapeutic exercise in ED.

	Theme	Reference
1.	Adopt a team approach with experts from a variety of relevant disciplines	5,23,27,41,45
2.	Continuously monitor medical status and safety concerns	5,7,23,27,36,41
3.	Screen for exercise-related psychopathology	5,7,22,27,36,38,45
4.	Create a written contract of how and when exercise will be used in treatment	5,45
5.	Include a psychoeducational component	5,7,23,33,38,40,42,46,47
6.	Focus on positive reinforcement	4,33,46–48
7.	Create a graded program	4,27,34,38,48
8.	Start with mild intensity and build slowly	27,33,34,38,41,45–48
9.	Tailor the mode of exercise to the needs of the individual	7,22,27,33,34,36,38,41–43,45
10.	Include a nutritional component to account for the physiological needs during exercise	5,33,40,42
11.	Debrief after exercise sessions	7,23,38,42

Evidence for exclusion of PA in ED treatment

- Properly adapted physical activity is almost never completely contraindicated!
 - Exception: extreme underweight, extreme purging and dehydration, extreme hypertension and uncontrolled type 2 diabetes
- Considerate intensity, duration, frequency and modality when the patient has one or more of the following:
 - Abnormal electrolyte values
 - Arrhythmia
 - Dizziness and syncope
 - Osteoporosis



Prescribe PA in treatment of ED:

- Somatic and psychiatric evaluation of the patient
- PA should be led by personnell with competence in physical activity, exercise physiology, exercise psychology and ED
- Volume
 - Frequency: maximum 5 days/week
 - Duration: maximum 45-60 min/session
 - Intensity: low-to-moderate intensity
- Focus
 - Enjoyment
 - Positive experiences and self-efficacy
 - Social dimension of group activities



«Running in stairs and in hills gives me associations to the compulsive exercise I did when I was ill. To me, as recovered, physical activity is about freedom. Freedom to take the elevator instead of the stairs. Freedom to choose the activities I feel like, and not the activities I feel obliged to.»



•Linn Bæra,

• ROS – Rådgivning om spiseforstyrrelser



NORWEGIAN SCHOOL OF SPORT SCIENCES

Eating disorders in athletes To train or not to train

Jorunn Sundgot-Borgen, Professor PhD
Norwegian School of Sport Sciences,
Department of Sports Medicine

NEDS, Helsinki 23.9.2016

Outline

- Athletes and eating disorders
- The Triad/RED-s
- Prevalence
- Consequences
- Risk assessment
- Prevention

Performance

- Natural ability
- Optimal training
- Optimal energy availability
- Optimal body composition
- Motivation



Making weight is part of many sports

8%-75% report abnormal eating behaviour and use of pathogenic weight control methods



Ein gewichtiges Problem

Magersucht-Gefahr bei Skispringern trotz BMI nicht gebannt ist.



Einar Romøren (NOR)
Größe: 182 cm Gewicht: 62 kg



Anders Jacobsen (NOR)
Größe: 175 cm Gewicht: 58 kg



Georg Späth (GER)
Größe: 189 cm Gewicht: 68 kg



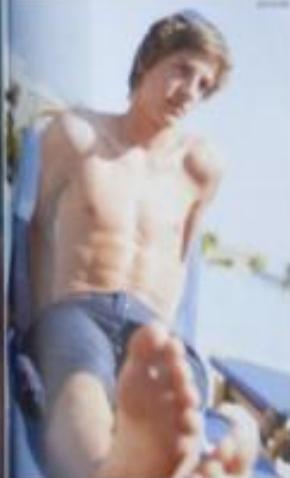
Martin Schmitt (GER)
Größe: 182 cm Gewicht: 64 kg



Anders Bardal (NOR)
Größe: 186 cm Gewicht: 65 kg



Thomas Morgenstern (AUT)
Größe: 184 cm Gewicht: 66 kg



Wolfgang Löffel (AUT)

Es war ein Bild, das die Sportwelt schockierte. Der spätere Tournee-Sieger Sven Hannawald beim Sommertraining 1999 in Badhoe- abmagert bis auf die Knochen, 54 Kilo bei einer Körpergröße von 1,85 Metern. Zehn Jahre später ist die Öffentlichkeit der Meinung, die Gewichtsproblematik wäre mit Einführung der BMI-Regel gelöst. Ein fataler Irrtum, der bald den nächsten Skispringer in die Magersucht treiben könnte!

„Die Lage hat sich gebessert, aber einige sind gefährdet und beim Gewicht sind noch immer viel schüchtern“, warnt Christian Moser. Der Kärntner lacht mit Österreichs Team 1994 Olympia-Bronze und tagpte im Jahr darauf als erster Springer in die Magersucht-Falle.

Regellücke. Das derzeitige Reglement schreibt den Skispringern nicht vor, woviel sie wiegen dürfen. Unter einem Body Mass Index von 20 in Klasse Ausrüstung (bedeutet netto einen BMI von 19) werden lediglich die Ski gekürzt – um zwei Zentimeter pro Kilo. Ein Wettbewerbsnachteil, der im wahrensten Sinne des Wortes kaum ins Gewicht fällt. Das beweist schon Gregor Schlierenzauer, der bei seinem Aufbruch im Weltcupstart 2009 mit weniger Gewicht und

kleinern Skiern auf Anhieb sagte. Heute sind es vor allem die Norweger, die trotz Untergewicht (siehe Aufmacher links) regelmäßig in die Spitzengänge fliegen. Damit greift die, auf Initiative der Österreicher geplante, Anhebung des BMI auf 20,5 eindeutig zu kurz. „Man müsste den BMI

zweigen des Herbstes zehn Kilo ab. Bei Christian 14 Kilo, eher der Internationales „Als auch die war es zu sp Pauli sch rechtzeitig haben. „M hat gemein einmal mit erzählt der Seite von WG-Kollege blicher hat Methode ge von Hunger haken. Stra wir nicht denken mus sind es meh die den 20- Intern ver

Wolfgang Löffel fordert eine Verschärfung des Reglements.

um einen ganzen Punkt anheben und die Ski massiver kürzen“, fordert ÖSV-Chef Ales Paumot Wolfgang Löffel geht sogar einen Schritt weiter. „Ich ein Springer zu weit unter dem Limit, sollte er ein Startverbot bekommen.“ Ein weiteres Herabschrauben des BMI ist für ÖSV-Sportdirektor Toni Innauer aber problematisch. „Eine Grenze über dem Wert, dem die Weltgesundheitsorganisation als Untergewicht bezeichnet, wäre nicht leicht zu durchsetzen.“

zeugt den 2 Saisenersta eignissen w zensumme a ze zu hungt denen das Ab schwerefällt e wandern. Pauli 208 d rnostatt weit diesen Herbst zehn Kilo ab. Bei Christian 14 Kilo, eher der Internationales „Als auch die war es zu sp Pauli sch rechtzeitig haben. „M hat gemein einmal mit erzählt der Seite von WG-Kollege blicher hat Methode ge von Hunger haken. Stra wir nicht denken mus sind es meh die den 20- Intern ver

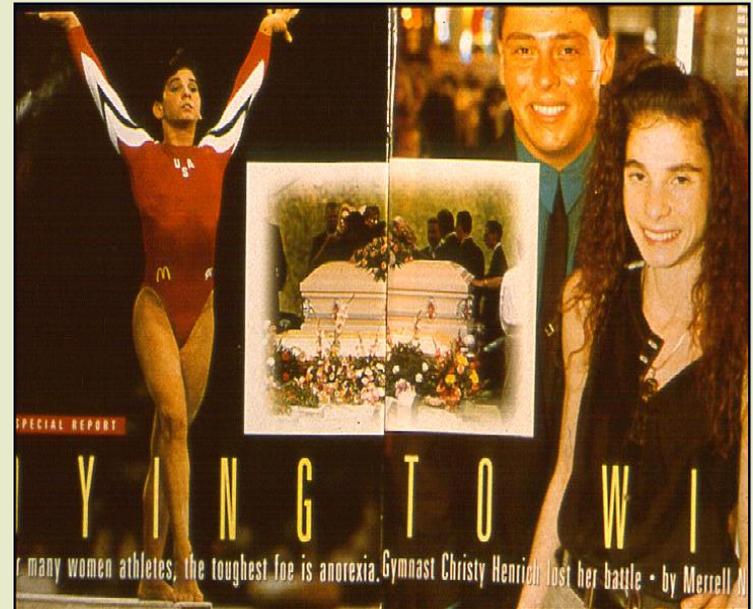
Gestörtes
Aber eben die Athleten ergebnis Um lie Martin davon ein 3 „Ich bin oft se gekommen lich die Best Frau Alexan da nichts im hauer“.



„Bei extremen Untergewicht muss ein Startverbot her!“

Dieting and dying to win

- Among the top 20 famous athletes with ED, 13 have medals in the Olympics and or World Championship or World cups.
- 3 have died from ED





Male World record holder

«The body has had enough»

Remen Evensen: - Kroppen har fått nok

Mener atletiske gener er årsaken til at han må legge opp
Takket nei til VM-plassen han var lovet



TUNG AVGJØRELSE: Johan Remen Evensen hadde tydelige problemer med å prate om at han ikke lenger skulle reise med hopplandslaget. Til høyre er sportssjef Ole Bredt Bråthen og i bakgrunnen sitter landslagstrener Alexander Stöckli. Foto: Scanpix

Av PER OPSAHL

(VG) 20.02.2012 17:47

Slutte saker fra Hopp



(VG Nett) Johan Remen Evensen (26) orker ikke å tyne kroppen mer, og legger opp med umiddelbar virkning. - Jeg har prøvd alt, men kroppen har fått nok, sier mannen med verdens lengste hopp.

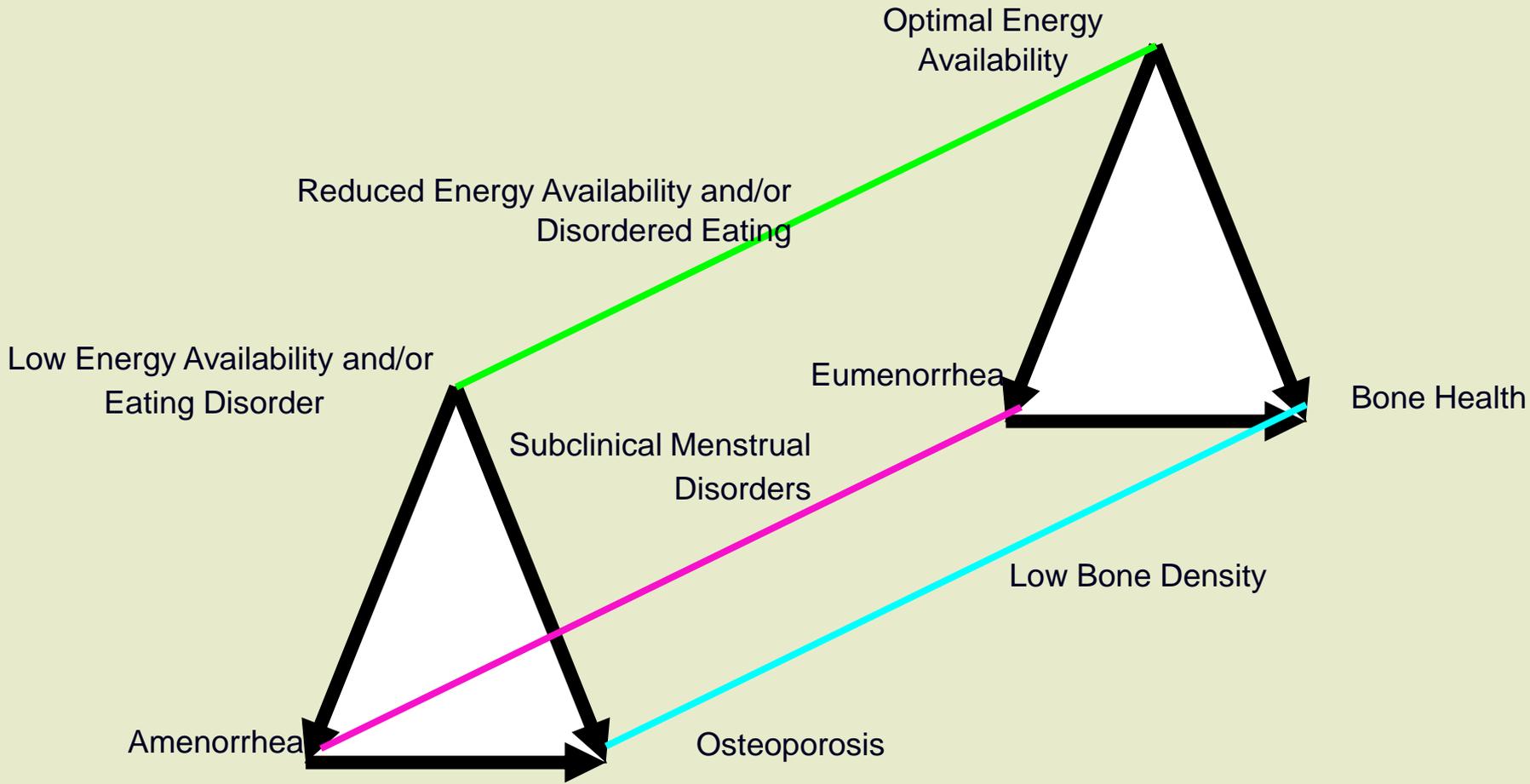
Scheele på grøtten på direkten: - Nå er det slutt!	23.03.2014, 13:09
Bardal: - Akkurat nå er jeg ganske lei skihopping	23.03.2014, 11:28
Det norske hoppelaget med tredjeplass i Planica	22.03.2014, 13:44
Freund slo Bardal med tre titler	21.03.2014, 22:42

- «I can not handle the situation with a starved body and the challenges with «making weight»
- “For sure I could have starved me even more to reach the optimal weight, but then I couldn’t achieve at my top level”

•<http://www.vg.no/sport/hopp/remen-evensen-kroppen-har-faatt-nok/a/10078282/>

•(Remen Evensen, nrk, 20.02.2012)

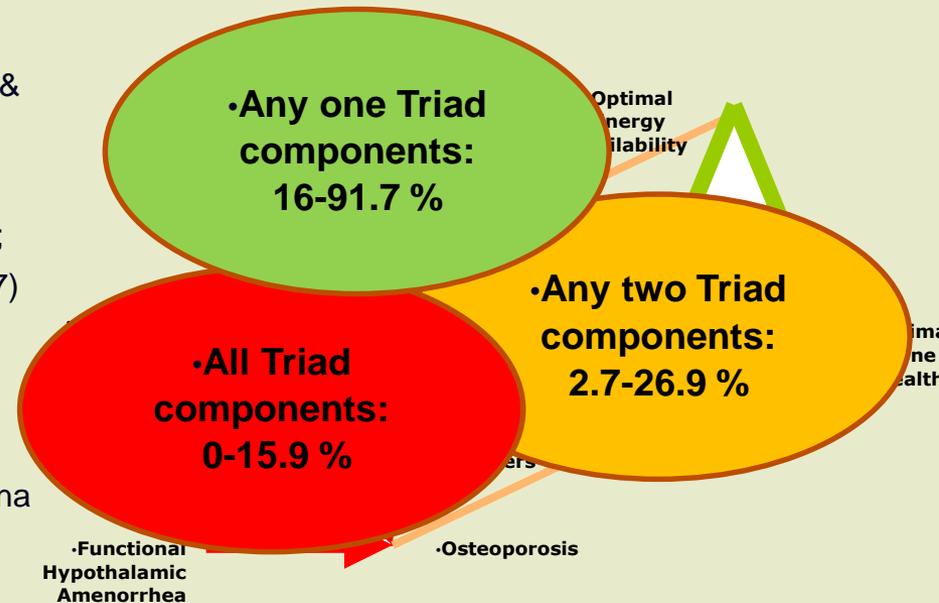
The Female Athlete Triad



The Triad is prevalent

(Gibbs et al., 2013; n= 9 studies; Coelho et al., 2013; Movaseghi et al., 2012)

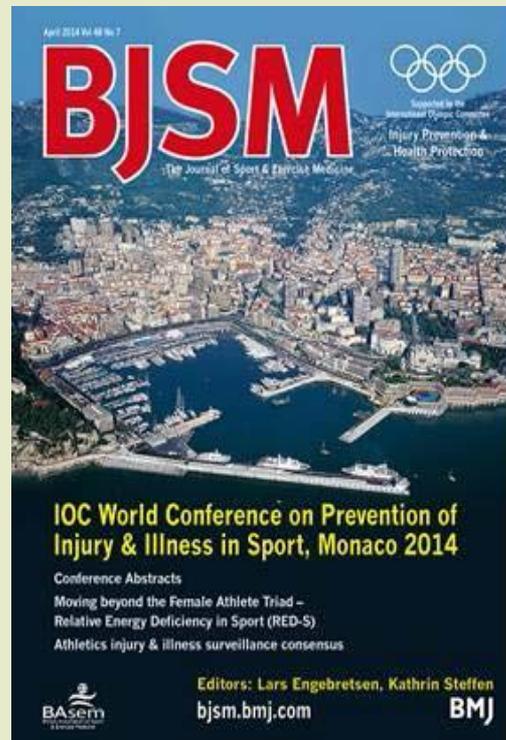
- **Elite athletes** (Pollock et al. 2010; Torstveit & Sundgot-Borgen, 2005)
- **Non-elite athletes** (Coelho et al., 2013; Movaseghi et al., 2012; Vardar et al. 2005; Hoch et al. 2007)
- **College athletes** (Beals & Hill, 2006)
- **High school athletes** (Schtscherbyna et al., 2009; Hoch et al. 2009; Nichols et al. 2007)
- *sedentary and normal active controls*) (Coelho et al., 2013; Burrows et al. 2007; Hoch et al. 2009; Torstveit & Sundgot-Borgen, 2005)





The IOC Consensus Statement

“Beyond the female athlete triad: **RED-S**”

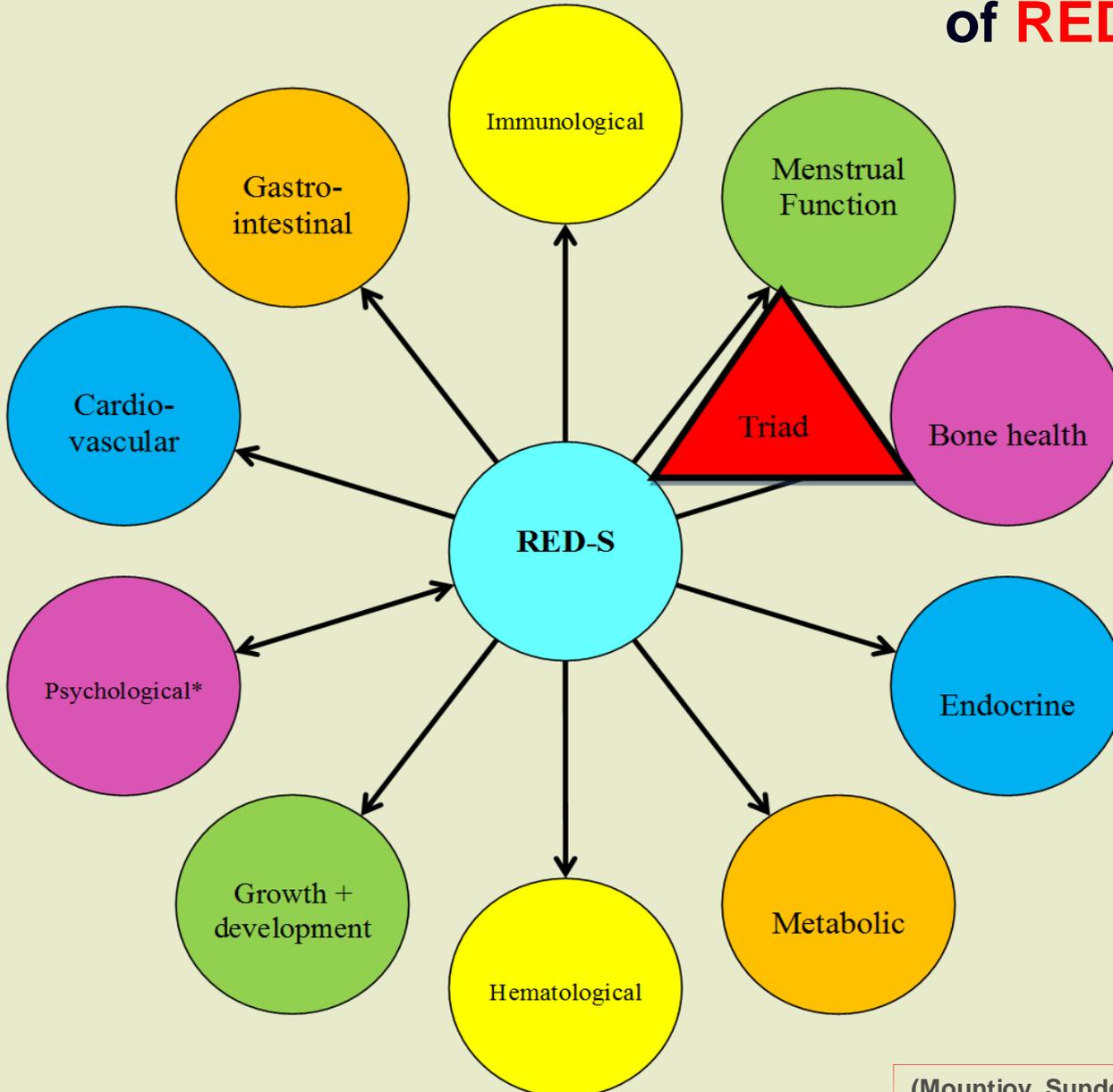


To cite: Mountjoy M, Sundgot-Borgen J, Burke L, et al. *Br J Sports Med* 2014;**48**:491–497.



Health Consequences

of RED-S

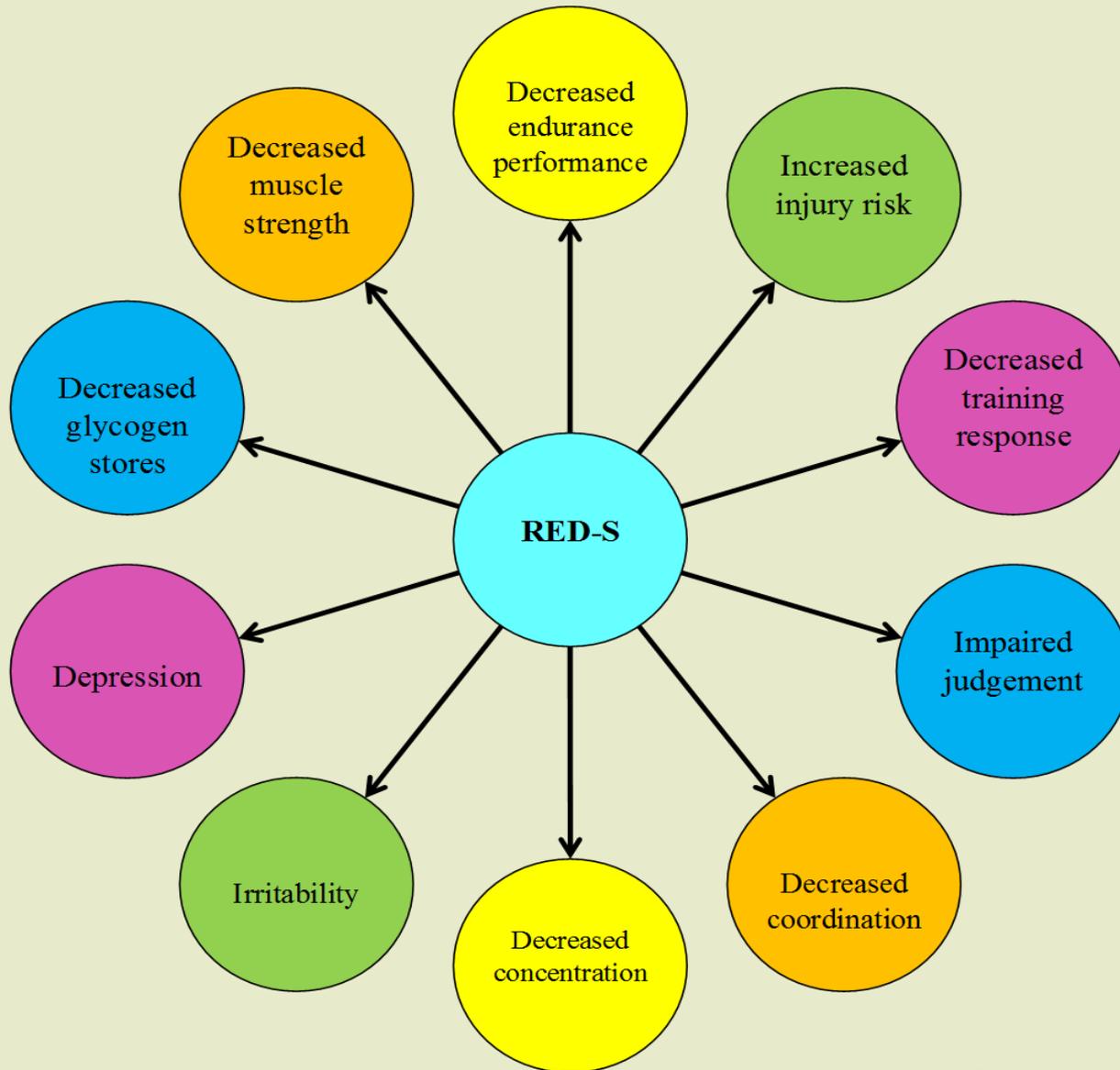


Constantini et al. 2002

(Mountjoy, Sundgot-Borgen, Burke, et al 2015)

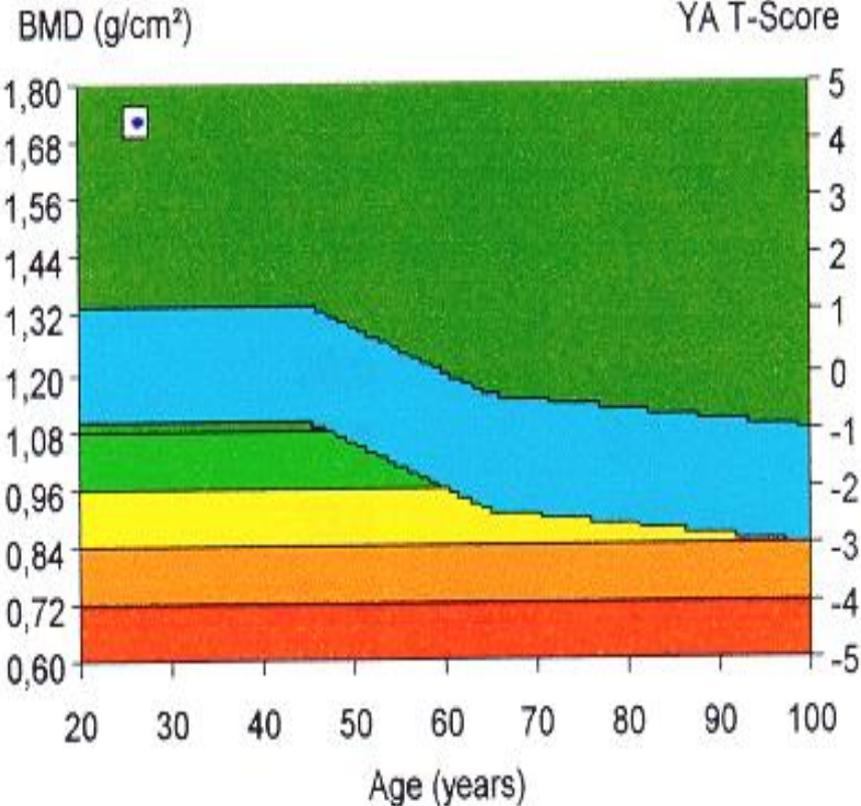


Performance Consequences of RED-S



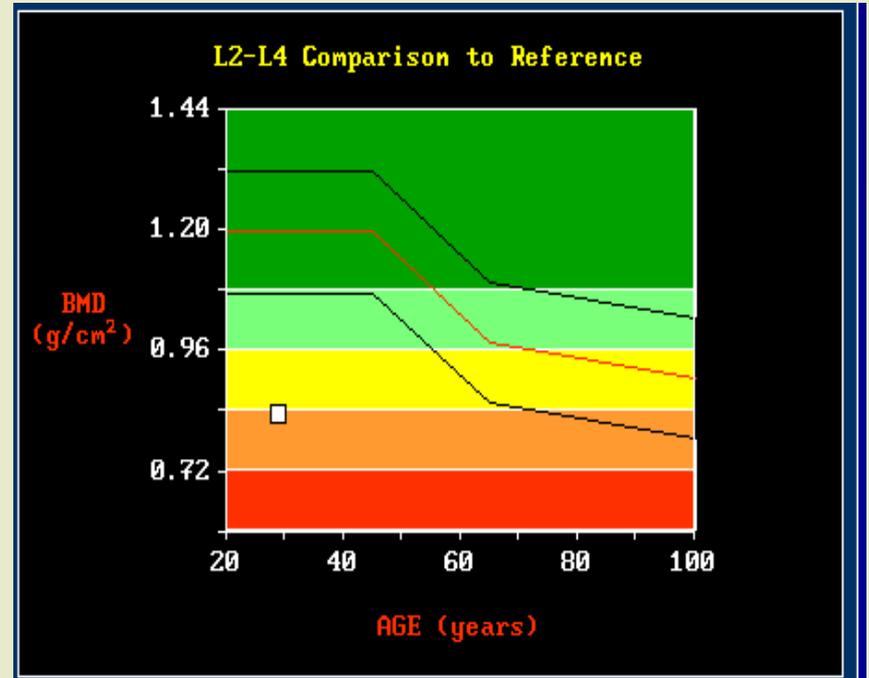
Healthy athletes

Reference: L2-L4

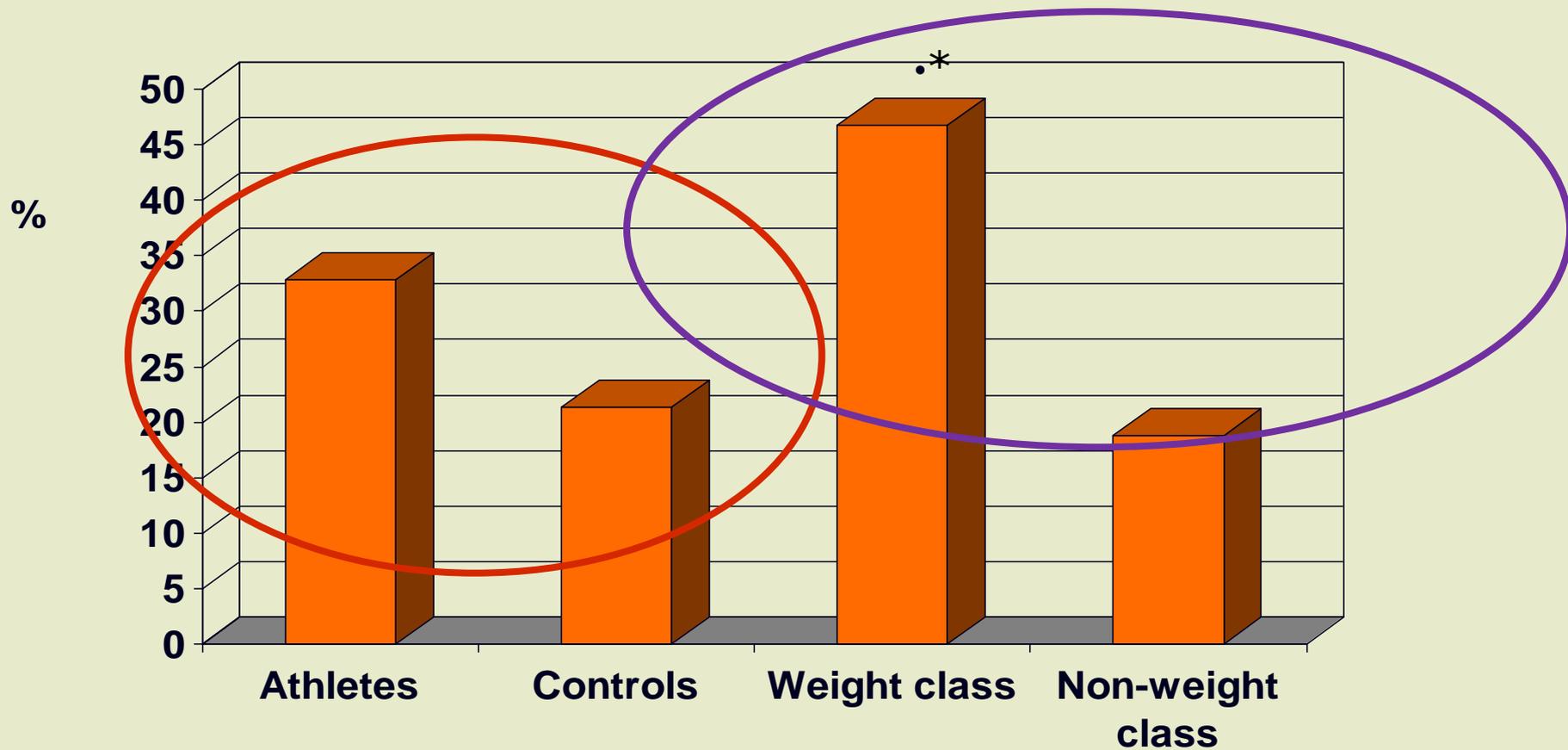


Low BMD – long distance runner

- 21 years
- 171 cm, 49 kg, 7% fat
- Amenorrhea
- Depressed
- Training 3 hrs/day



Prevalence of eating disorders in elite athletes (n=572) and controls (n=570)



•Torstveit & Sundgot-Borgen, 2005.

•* $p < 0.001$

Eating disorders in male athletes

- Byrne & McLean, 2002: **Australian** elite athletes;
 - **4%** (versus 0% among male controls)
- Sundgot-Borgen & Torstveit, 2004: **Norwegian** male elite athletes;
 - **8%** (versus 0.5 % among male controls)
- Schaal et al., 2011: **French** male elite athletes;
 - **4%**
- Martinsen et al., 2013: **Norwegian** adolescent elite athletes
 - **3,2%** (versus 0% for male controls)

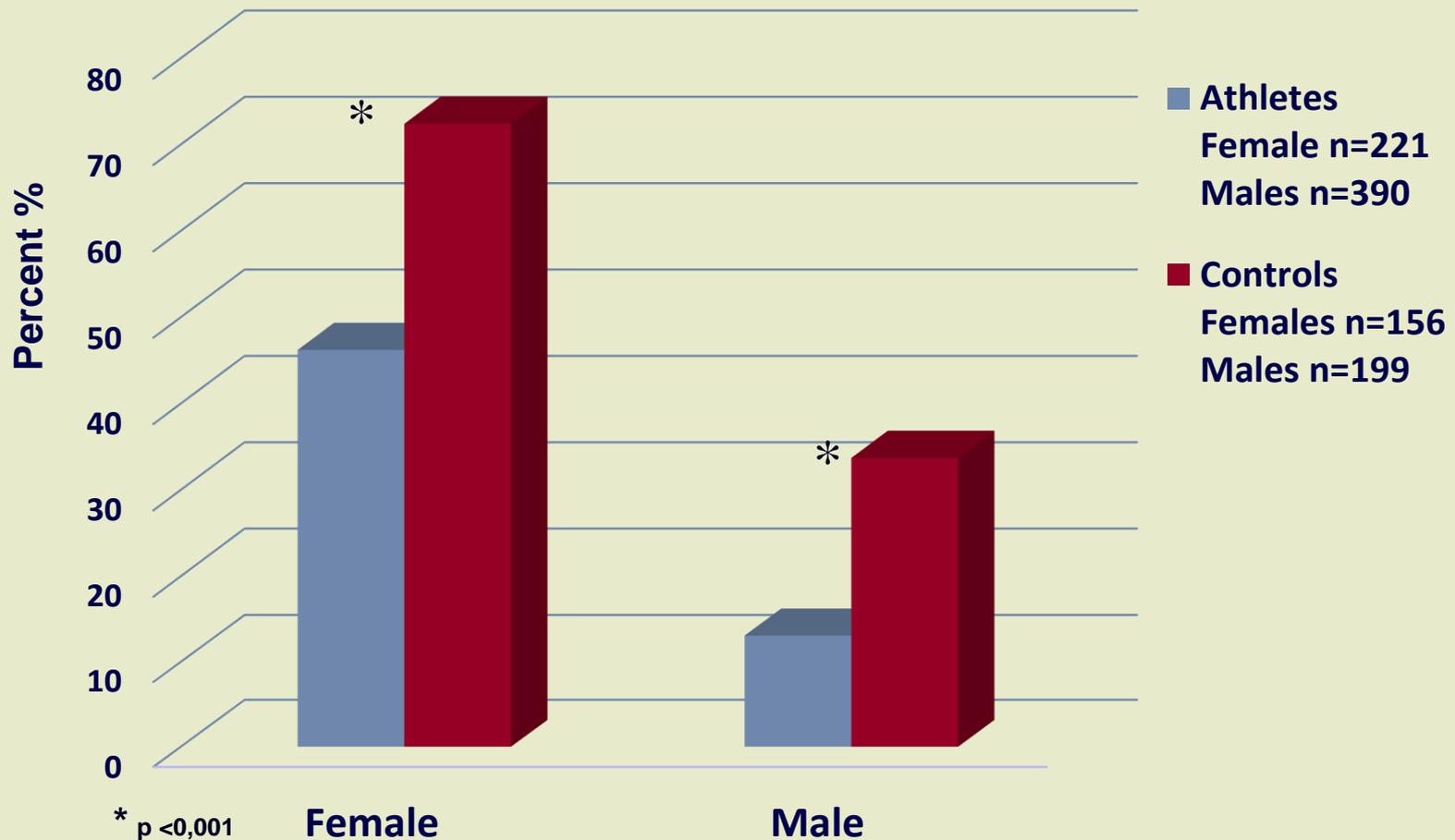
Prevalence in elite adolescent athletes

- 16 Elite Sport High Schools
 - Athletes, $n = 677$
 - 50 different sports

- 2 High Schools
 - Controls (non-athletes), $n = 421$



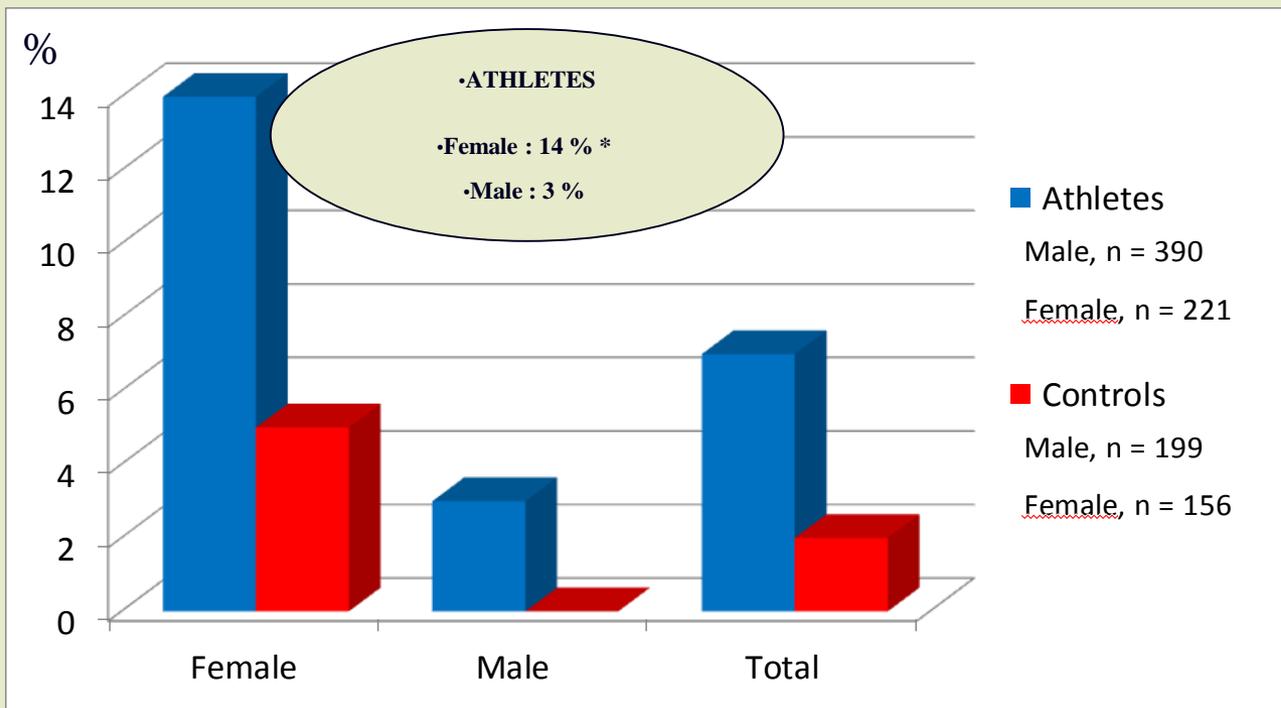
Prevalence "at risk" of EDs athletes vs controls



Higher Prevalence of Eating Disorders among Adolescent Elite Athletes than Controls

MARIANNE MARTINSEN¹ and JORUNN SUNDGOT-BORGEN²

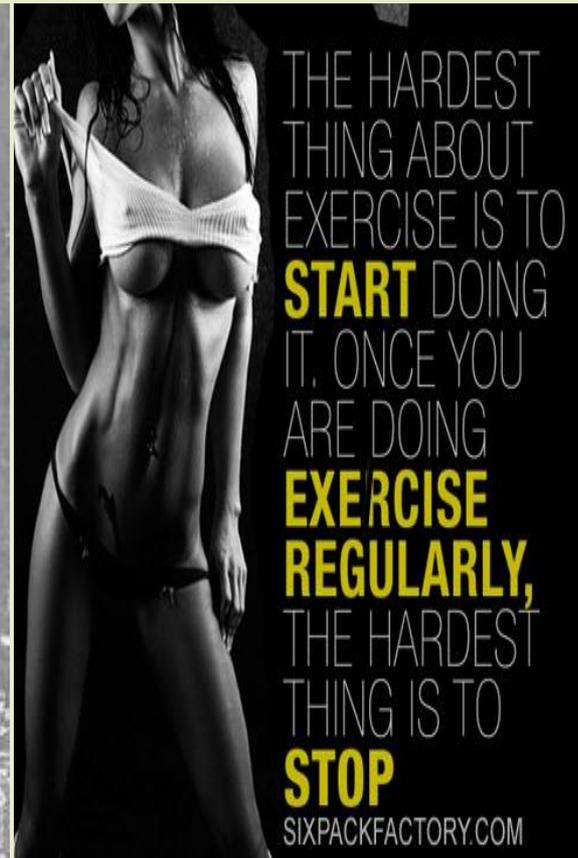
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*P≤0.01

•Martinsen & Sundgot-Borgen, 2012

Strong is the new skinny



#fitspiration goes wrong!



Tiggeman &
Zaccardo 2015

And it is popular!

•The emphasis is on a well-shaped, fit, healthy and attractive appearance, similar to that of models"



Prevention



The Health, Body and Performance Study

Intervention

Participants:

Elite Sport High Schools (n=16)

- **n=611 Athletes**
(first year students born in 1992)
- n=101 Coaches

PRE TEST

N = 611 (90 %)

Intervention = 348 Control = 263



N = 498

POST TEST 1

N = 469 (94 %)

Intervention = 264 Control = 205



N = 468

POST TEST 2

N = 468 (100 %)

Intervention = 272 Control = 196



ANSWERED ALL THE TESTS

N = 439 (94 %)

Intervention = 247 Control = 192

EXCLUDED

Eating disorders

N = 34 (6 %)

I = 18 K = 16

Dropt out of school

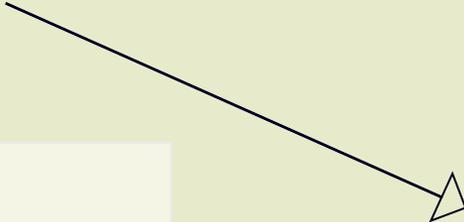
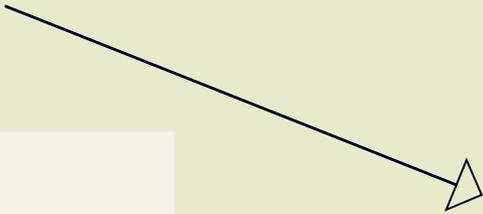
N = 79 (13 %)

I = 41, K = 38

Dropt out of school

N = 30 (6 %)

I = 17, K = 13



Athletes - 1 year Intervention

Topics:

self-esteem, self-confidence, motivation, growth and development, recovery strategies, sports nutrition and ED in relation to health and performance

Organization:

lectures, teamwork, practical and theoretical assignments

Communication:

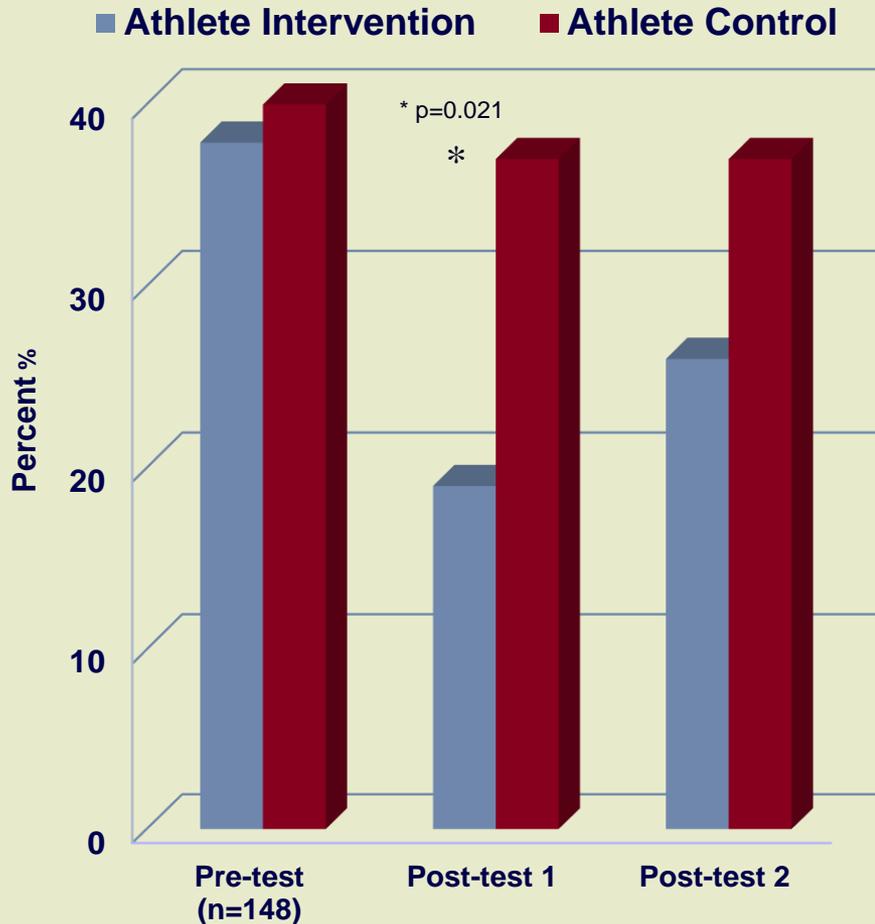
lectures at school, E-mails, Fronter/ It`s learning and Facebook

Preventing EDs among athletes

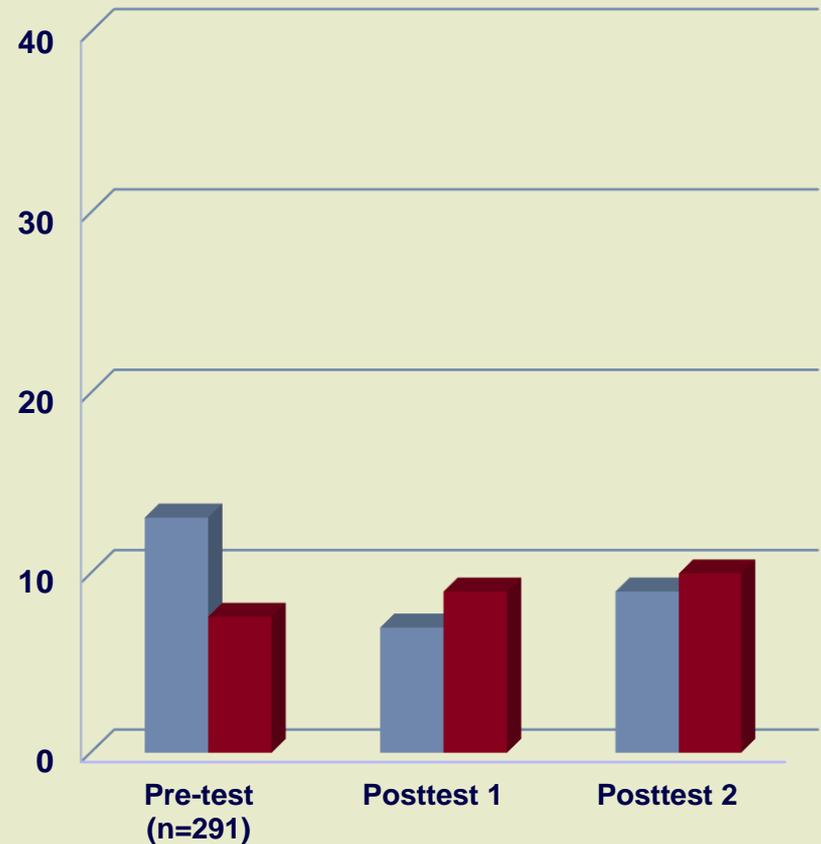
– *is it possible?*

Pre-test to post-test 2:

- No new cases among female intervention gr.
- 13 percent new cases among female controls
- One NEW case of ED in the athlete male control group



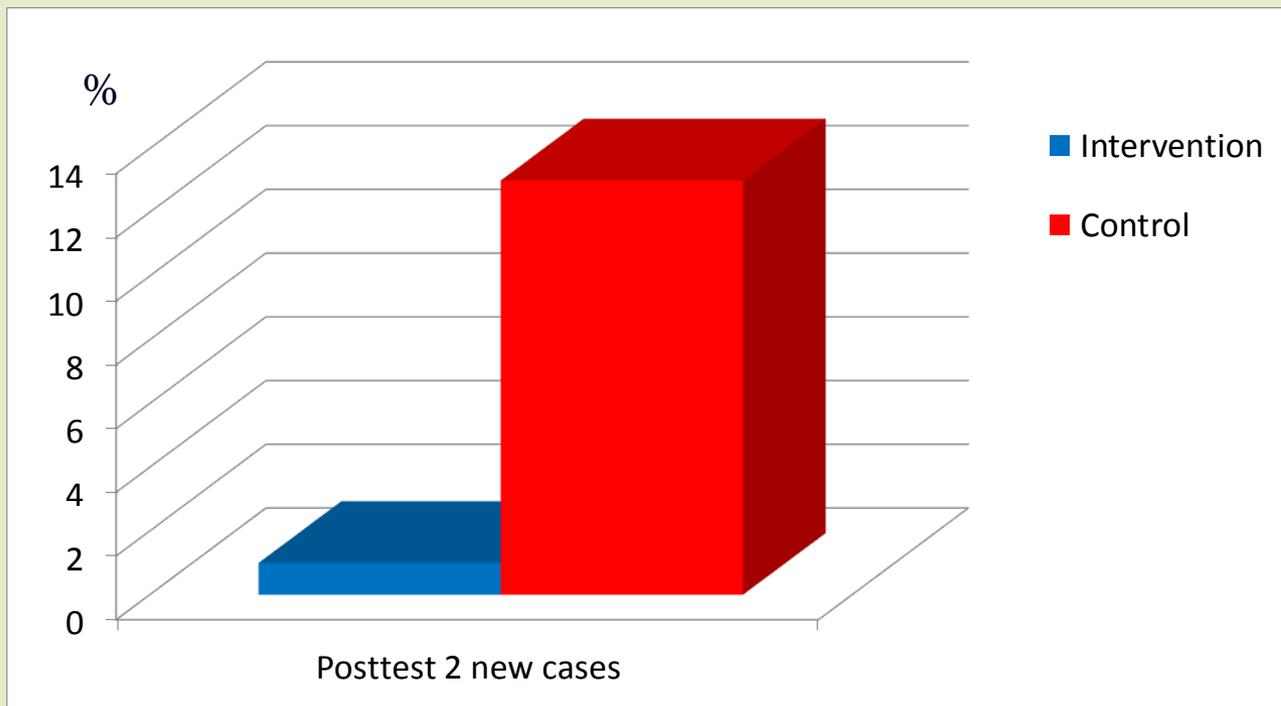
Females with symptoms ass. with ED –
New cases from Pre-test to Post-test



Males with symptoms ass. with ED –
New cases from Pre-test to Post-test

Post test 2

Prevalence of new ED cases among female athletes



What about the coaches?

Post-test results (adjusted for pretest values)

Intervention group coaches (n=49) higher index scores than control school coaches (n=27) for:

- **Total knowledge**; weight-regulation, ED, nutrition:
→ 35.0 ± 7.2 vs. 31.6 ± 8.0 , $p=0.021$.
- **Weight-regulation**:
→ 6.2 ± 1.7 vs. 4.8 ± 1.3 , $p<0.001$
- **ED** (including recognition and management):
→ 19.3 ± 4.4 vs. 16.5 ± 5.0 , $p=0.004$
- **Subjective knowledge about ED**:
7 times higher for coaches at intervention schools (for “somewhat good” knowledge or better)
→ OR= 7.1, 95% CI 2.2 to 23.3, $p=0.001$



Identification of ED and DE

- Early detection and treatment is recommended to become a high priority for athletic programs

(Bonci et al., 2008)

- HOW?????

Identifying athletes is a *challenge*

- Symptoms vs «normal» or desired characteristics in sport?
- Characteristics of individuals with ED & traits of «good athletes» may be similar
- Athletes rarely self-identify
 - Secrecy, shame, denial and fear of reprisal

Screening for ED

- Questionnaire
 - Developed and validated in primary care & or general populations
 - Not sport-specific
- Clinical Interview
 - Time consuming & expensive
 - The preparticipation physical examination (PPE)

The IOC relative energy deficiency in sport clinical assessment tool (RED-S CAT)

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In April 2014, the International Olympic Committee (IOC) published a Consensus Statement in the *British Journal of Sports Medicine* (BJSM) entitled "Beyond the Female Athlete Triad – Relative Energy Deficiency in Sport (RED-S)". To assist sports medicine professionals working in clinical sports medicine with the practical screening and management of the RED-S athlete, the IOC authors have developed a Clinical Assessment Tool – the **RED-S CAT**.

It is well known that the utility of scientific knowledge is limited at a practical

level and that implementing effective interventions in the real life sport setting are challenging. As in all areas of medicine, there is now attention in sports medicine to the growing field of knowledge translation. Effective translation of the science into practical usable formats are necessary to ensure that athlete care is both evidence based and effective.

Sports medicine clinicians utilise guiding principles and various models to assist with the medical management and harm minimisation in their course of their care of athletes. The RED-S 'Red Light – Yellow Light – Green Light' Risk Assessment and Return to Play (RTP) models are designed to take a complex clinical assessment and RTP decision making process and integrate them into a functional model that is both simple to understand by the athlete and the clinician, and is relatively easy to implement in the 'real world'. Effective sports medicine models are designed with latitude to accommodate the interpretation of an athlete's unique situation by the treating clinician, acknowledgement of mitigating factors, ongoing monitoring of the individual, and continual re-evaluation of the model. The RED-S 'Red Light – Yellow Light – Green Light' Risk Assessment and Return to Play models were developed with this flexibility to allow clinicians in the field the ability to adapt the model to their particular athlete situation. These models enable the treating clinicians to apply their knowledge of the sport-specific demands and case-specific parameters, combined with their clinical

experience, within the flexible parameters of the model. The models were developed to be adaptable for both males and females. The endpoints identified as **red light "high risk"** criteria and the **yellow light "caution"** criteria all apply to both male and female athletes except for the two endpoints related to the menstrual cycle. These models have been implemented successfully since 2012 at the competitive level, for all ages and sport disciplines of athletes at the Norwegian Olympic Training Center. The IOC authors recommend that the RED-S conceptual models should be integrated into performance nutrition educational approaches, as they offer an opportunity for athletes and coaches to understand the broad scope of issues related to suboptimal eating practices.

To facilitate this recommendation, the IOC authors have developed a RED-S Clinical Assessment Tool (**RED-S CAT**) modelled after the Sport Concussion Assessment Tool (SCAT-3), which is widely used in clinical practice. Utilisation of the **RED-S CAT** will assist clinicians in the field with the screening of athlete populations at risk and the management of return to play decisions of RED-S athletes. Like the original SCAT, the **RED-S CAT** is designed to facilitate clinical practice and to encourage further research and validation. It is expected that the **RED-S CAT** will evolve over time as the body of science in the field grows.

The **RED-S CAT** should be implemented globally to facilitate and improve the medical management of both male and female athletes with RED-S.

► The RED-S CAT clinical assessment tool is available on our website <http://bjsm.bmj.com>.



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IOC Clinical Practice Models

Red light, Yellow light, Green light

A model for risk stratification and return to play decision making



RED-S CAT™

Relative Energy Deficiency in Sport (RED-S)
Clinical Assessment Tool (CAT)

for use by medical professionals only
name

RED-S - Sport risk assessment model for sport participation

High Risk: RED LIGHT	Moderate Risk: YELLOW LIGHT	Low Risk GREEN LIGHT
<ul style="list-style-type: none">• Anorexia Nervosa and other serious EDs• Other serious medical (psychological and physiological) conditions related to low energy availability• Extreme weight loss techniques leading to dehydration induced haemodynamic instability and other life-threatening conditions	<ul style="list-style-type: none">• Prolonged abnormally low % body fat or sum of skinfolds• Substantial weight loss (5-10% BM in one month)• Attenuation of expected growth and development in adolescent• Abnormal menstrual cycle: FHA amenorrhea > 6 months• Menarche > 16 years• Abnormal hormonal profile males• Reduced BMD (either from last measurement or Z-score < -SD)• History of 1 or more stress fracture associated with hormonal/menstrual dysfunction and or LEA• Athletes with physical/psychological complications related to LEA/DE<ul style="list-style-type: none">- ECG abnormalities- Laboratory abnormalities• Prolonged relative energy deficit• DE behaviour affecting other team members negatively• Lack of progress in treatment/non compliance	<ul style="list-style-type: none">• Healthy eating habits with appropriate energy availability• Normal hormonal and metabolic function• Healthy BMD as expected for sport, age and ethnicity• Healthy musculoskeletal system

Sport risk assessment model

RED LIGHT



Clearance to participate in sport denied

Athlete to receive treatment

Use of a treatment contract advised

Sport risk assessment model

YELLOW LIGHT



Cleared to supervised training with a medical treatment plan

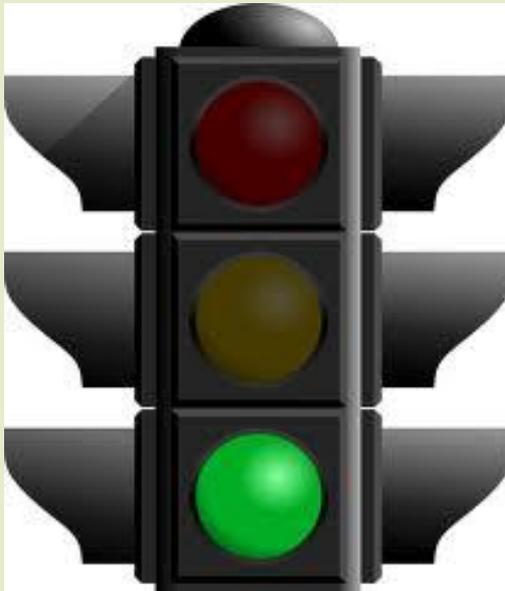
May compete once cleared under supervision

Re-evaluation at regular intervals (1-3 months)

Regular reassessments for compliance and progress

Sport risk assessment model

GREEN LIGHT



Full training and competition
allowed with no stipulations

RED-S

Decision-based Return To Play Model (Modified from Creighton et al, 2010)

STEPS	RISK MODIFIERS	CRITERIA	RED-S SPECIFIC CRITERIA
STEP 1 Evaluation of health status	Medical factors	Patient demographics Symptoms Medical history Signs Laboratory tests Psychological health Potential seriousness	Age, sex See yellow light column Recurrent dieting, menstrual health, bone health Weight loss/ fluctuations, weakness Hormones, ECG, DEXA Depression, anxiety, ED Abnormal hormonal & metabolic function, stress fracture
STEP 2 Evaluation of participation risk	Sport risk modifiers	Type of sport Position played Competitive Level	Weight sensitive, leanness sport Individual vs. team sport Elite vs. recreational
STEP 3 Decision modification	Decision modifiers	Timing and season , Pressure from athlete External pressure Conflict of interest Fear of Litigation	In/out of season, travel, environmental factors Desire to compete Coach, team owner, athlete, sponsors If restricted from competition

Case 1: World Champion 2011



Case 1: The first athlete officially not allowed to compete

Kristin Størmer Steira to Sit Out Rybinsk Races; Benched Due to Weight Concerns

February 3, 2012 By Chelsea Little



Steira competing in the seventh stage of the Tour de Ski last month.

In December, Norwegian broadcaster NRK reported that an unnamed member of the Norwegian national team had been flagged for low body weight and that coaches and staff were hoping to help the female athlete gain weight and return to better health.

Almost two months later, it seems likely that the woman in question was Kristin Størmer Steira, who was benched for the Rybinsk races this weekend due to low body weight. Norwegian daily newspaper Dagbladet broke the story on Thursday with an interview with Steira.

"I was frustrated when I heard [the decision]," Steira said in the interview. "I really wanted to go race in Russia. But after thinking about myself, is it actually just fine. I have respect for my health and I know how important it is. So I don't have a problem following advice from professionals who know what they are talking about."

Case 1

December 2011



Steira competing in the seventh stage of the Tour de Ski last month

- Relative energy deficiency
- Lost BW
- Low % BF

- Not allowed to compete
- Close follow up and had to increase;
 - Energy intake
 - BW
 - % BF



RED-S - Decision-based Return To Play Model

STEPS	RISK MODIFIERS	CRITERIA	RED-S SPECIFIC CRITERIA
<p>STEP 1</p> <p>Evaluation of health status</p> 	<p>Medical factors</p>	<p>Patient demographics</p> <p>Symptoms</p> <p>Medical history</p> <p>Signs</p> <p>Laboratory tests</p> <p>Psychological health</p> <p>Potential seriousness</p>	<p>30 yrs, female</p> <p>Acceptable energy availability</p> <p>Increased BW and % fat</p> <p>Responding to training</p> <p>Felt good</p>

RED-S

Decision-based Return To Play Model (Modified from Creighton et al, 2010)

·IOC WORLD CONFERENCE

·PREVENTION OF INJURY AND ILLNESS IN SPORT



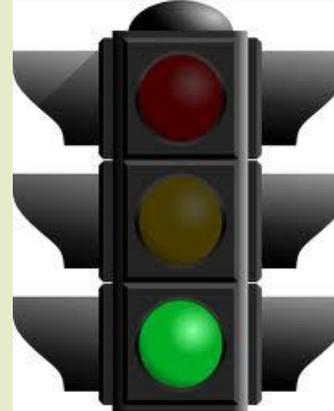
STEPS	RISK MODIFIERS	CRITERIA	RED-S SPECIFIC CRITERIA
<p>STEP 2</p> <p>Evaluation of participation risk</p>	<p>Sport risk modifiers</p>		

Case 1



Steira competing in the seventh stage of the Tour de Ski last month.

February 2012



February 2014 Bronze in Olympics



Treatment contract

APPENDIX

Relative Energy Deficiency in Sport (RED-S) Treatment Contract

RED-S Treatment Contract for _____

Multidisciplinary Team:

- (Physician) _____
- (Psychotherapist/Psychiatrist) _____
- (Exercise physiologist) _____
- (Dietitian) _____
- (Other) _____

Requirements

Meet with:

- The psychotherapist at intervals recommended by the health professional treatment team
- The dietitian at intervals recommended by the health professional treatment team
- The physician at intervals recommended by the health professional treatment team
- Follow daily meal plan developed by the health professional treatment team
- Follow the adapted training plan developed by the health professional treatment team
- If underweight, weight gain expected to be _____ kg per week./weight stable within week: _____
- If underweight, must achieve minimal acceptable body weight/fat of _____ kg/percent by _____
- Regular weigh-in at the following time intervals of _____ week (s)
- After this date, _____ (dd/mm/yyyy), must maintain weight and % fat at or above minimal acceptable body weight/fat mass of _____ (kg/%)
- Other _____

If **ALL** requirements are met and the eating behavior (and other severe conditions) are normalized the Team Physician will decide if cleared for competition.

I, _____ have read this contract and all of my questions were answered.

_____ Athlete Name	_____ Athlete Signature	_____ Date
_____ Team Physician Name	_____ Team Physician Signature	_____ Date

References

Mountjoy M, Sundgot-Borgen J, Burke L, et al. IOC Consensus Statement. Beyond the Triad – RED-S in sport. Br J Sports Med. 2014; 48: 491-7.

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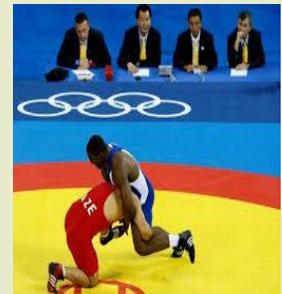
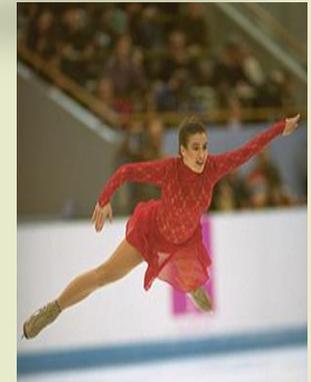
Prevention

- Education
- Be open! RED-s and ED are sport injuries
- Use the tools
- No acceptance
- Regulations
- Healthy ideals

Risk and trigger factors



- Dieting/restrictive eating
- Insufficient energy intake and/or high energy expenditure
- Lack of knowledge, time and planning
- Mismanagement of athlete's needs to change BC
- Early specialization
- Injuries/illness/overtraining
- Coaching behavior (and knowledge)
- Decline in performance level/lack of motivation
- Regulations



Talk to the athletes!

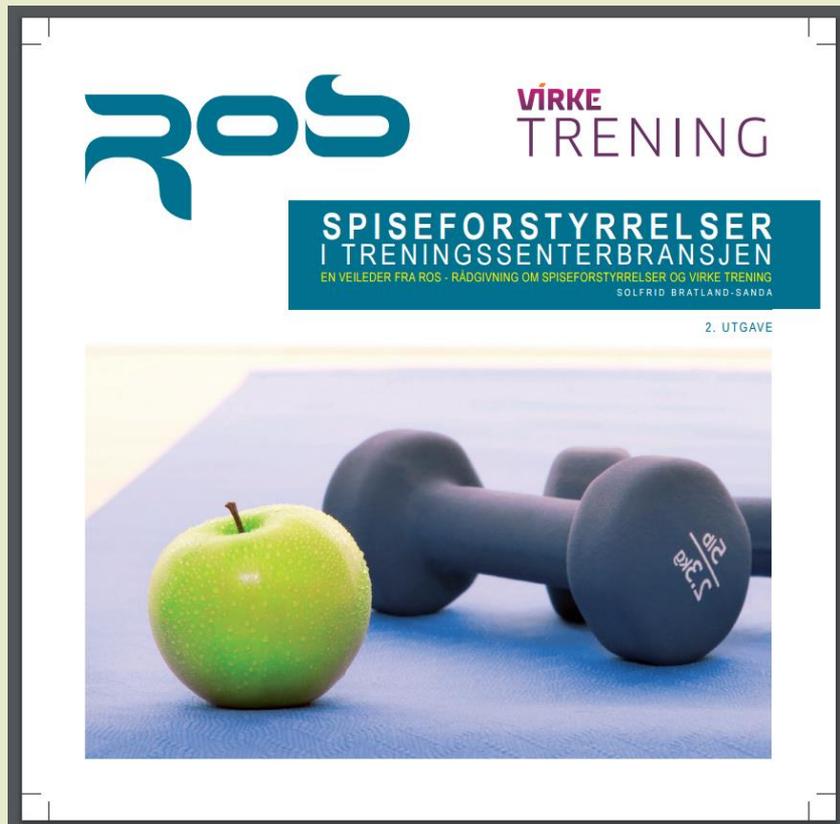
(Torstveit, 2004; Drinkwater et al., 2005)

Questions about food	Questions about weight	Questions about menstruation	Questions about training and injuries
Do you feel that you have a "relaxed" relation to food?	What have your highest and lowest body weight been during the last year?	When did you experience your first menstruation?	Please describe your normal training volume (frequency, intensity, duration)
Please describe your eating habits*	What would you say your "competition" body weight is?	Have your periods been regular since you first began menstruating?	Have you altered training methods, volume or intensity recently (or in the past)?
How many meals do you eat per day?	Have you lost weight recently? How did you achieve the weight loss?	What is the longest period of time you have experienced lack of menstrual bleeding?	Do you practice any exercise in addition to your sport-specific training?
Are there any types of food you try to avoid or do you have any "forbidden" foods?	Are you comfortable with your current body weight?	When was your last period?	Have you had any problems with overuse injuries? What type of injuries?
Can you tell me what you ate and drank yesterday?	Are there other people who are especially interested in your body weight?	How do you feel about having/not having menstruation?***	Have you ever had a stress fracture or a normal fracture?
Possibly question the athlete about purging-methods (preferably referring to the past)		Do you currently use oral contraceptive pills or other contraceptives? Have you used them in the past?	When experiencing an injury, did you take time to recover? How did you feel about that?

Take home messages I:

- Physical activity involves all forms of bodily motion – physical inactivity is one of the biggest health challenges of the 21st century
- Exercise becomes pathological when it becomes the center of life, and the rest of the life must be adapted to the exercise routines
- Pathological exercise must be taken seriously because it is associated with more severe psychopathology, poorer treatment outcome and higher risk of relapse
- No current guidelines exist on how to deal with pathological exercise, but CBT and adapted exercise has shown promising results
- Adapted exercise as part of ED treatment has shown physiological and psychological effects

Norwegian guidelines



Appendix B

Short version of Norwegian guidelines for management of concerns about ED in fitness center settings.

1. The center needs written procedures for management of eating disorders concerns, these procedures should be included in the safety instructions.
2. One employee, preferably in the management group, should be in charge for compliance with the procedures. The person in charge has the duty of confidentiality in regards to reported concerns.
3. All new employees must acquaint themselves with the procedures. It is, therefore, recommended to hand out the procedures with the employee contract.
4. Employees and members of the fitness center who are concerned about other employees and/or members should report this to the person in charge.
5. The person in charge must contact the employee/member whom it concerns and invite him/her to a dialog. How this contact is made can be individual, but it is essential that it is discrete and treat the employee/member with respect.
6. The dialog should take place in a private setting at the center (i.e., an office).
7. In the dialog, the person in charge must present the concerns and concrete observations, and encourage the person to tell about his/her exercise and eating behavior. The person in charge must be nonjudgmental, respectful, polite, empathic, and caring.
8. The person in charge must prepare him-/herself for different reactions to the presented concerns, and prepare him-/herself for how to respond to these reactions. It is crucial to still be calm, nonjudgmental, responsive, respectful, and empathic.
9. The person in charge should bring with him/her information about where to seek help. The fitness center is recommended to have an updated list of nearby eating disorders treatment facilities.
10. If the employee/member of concern refuses to talk about the concerns, and no changes happen, the person in charge must request another appointment with the employee/member.
11. The person in charge can ask for a medical confirmation that it is safe for the employee/member to exercise. This medical confirmation cannot contain sensitive information such as birth date, social security number, and/or sensitive information, such as illness information, and so forth. The medical confirmation should only be shown to the person in charge. It is forbidden to take a copy of it.
12. Exclusion of the employee/member from the fitness center should only be used as a last resort when less radical actions have failed. The employee/member must not be discriminated and harassed, and the center must not perform actions, which can be discriminating or harassing.



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Take home messages II:

1. We must not close our eyes for challenges related to disordered eating and low energy availability among athletes
 - NB! Leanness sport athletes
 - Serious health and performance consequences
2. Early identification is important!
3. We need to talk to the athletes
4. Use the clinical tools (RED-s CAT)



Movaseghi et al., 2012 ; Coelho et al., 2010; Torstveit & Sundgot-Borgen, 2011; Nichols et al., 2006; Beals & Hill, 2006; Nattiv et al., 2007, Mountjoy et al., 2014)