Disordered Eating and Eating Disorders in Sports: Elective Online-course

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Abstract

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Disordered eating and eating disorders have increased among athletes. The commission of this project was to develop the elective online course for Haaga-Helia's student of disordered eating and eating disorders. The main aim of the product was to raise the awareness of coaches in disordered eating and eating disorders in a field of sport. Project included the planning phase, information retrieval phase, theoretical framework and online course creations based on the theory. Implementation and controlling phases are scheduled on the beginning of 2023.

Theory was written by using the reliable online sources. The online course was designed based on written theory. Moodle was selected to course management system software, where the whole course was build. Course description was written to Haaga-Helia's database for course marketing. The objectives and evaluation criteria for the course were designed in line with the aim of the project. Visually considered lectures with copyright pictures and videos were created to Power Point.

The final product of the project was the elective online course, including three lectures and tasks performed asynchronous. The pilot version of the course is held at the beginning of 2023. The final assignment of the course was designed for students to utilize in their working environment, by the aim of transfer course content into practice.

The goal was to design an online course to educate students of disordered eating and eating disorders. The main themes included to the course were signs and symptoms, how to prevent disordered eating and take into consideration the predisposing factors on specific sports, as well as how to approach the athlete with signs and symptoms. Reflecting the goal, the course provides all the information aimed. The final results from achieving the aim and the goal are obtained after the controlling phase scheduled on the beginning of 2023 after the pilot course.

Key words
Disordered eating, eating disorders, prevention, identification, recovery

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1 Introduction

The research published 2019 in American Journal of Clinical Nutrition shows that eating disorders are highly prevalent worldwide, especially in women. The prevalence of eating disorders have increased from 3.5% for the 2000-2006 period to 7.8% for the 2013-2018 period. (Galmiche, Déchelotte, Labert &Tavolacci 2019) Eating disorders have become more common and the prevalence today may be certainly even higher.

Athletes are uniquely vulnerable to disordered eating and eating disorders due to the relationship of the athletic performance may have with the nutritional intake and training schedule. Understanding and knowing the risks athletes may face is the key of providing preventative support and coaching. In addition to this, it can help to reduce the likelihood of eating disorder development as well as increase the likelihood of early identification and approach and therefore, long-term recovery. (Rittenhouse 2021)

This project based thesis is created to educate the coaches and individuals working in the field of sport about disordered eating and eating disorders in sports. The final product of this project is an elective online course for Haaga-Helia's students. The course covers the topics of disordered eating, eating disorders and how to prevent, identify and approach the athlete with the signs and symptoms of disordered eating or eating disorders. This project aims to highlight the prevalence of eating disorders in sports and the responsibilities of the coach. Constantly growing problem needs to be highlighted in a sense of understanding and address.

Eating disorder education should be a mandatory part of the educational curriculum for coaches and athletes across all sport as a part of prevention strategy, otherwise coaches may continue to perpetuate erroneous beliefs. An excellent prevention strategy to initiate eating disorders is simply to increase knowledge among athletes and their coaches about risk factors, risk groups and early identification strategies. Primary prevention should involve education and instruction to prevent extreme dieting and eating disorder onset. In addition, as a coaches it is really important to protect athletes from factors that can predispose them to develop eating disorder. Educational programs should promote self-acceptance, healthy eating and reasonable training. (Coelho, Gomes, Ribeiro & Soares 2014)

2 Disordered Eating

Disordered eating sits on a spectrum between normal eating and an eating disorder. It may include behaviours and symptoms of eating disorders in a lesser frequency or lower level of severity. Disordered eating may include irregular or inflexible eating patterns, restrictive eating or compulsive eating. Dieting is the most common form of disordered eating as well as the most common risk factor for development of an eating disorder. Signs and symptoms such as skipping meals, avoidance of certain foods and use of laxatives, diuretics, steroids, creatine and diet pills may occur on people with disordered eating behaviour. (National Eating Disorder Collaboration 2022)

Disordered eating is the term, which is a descriptive phrase, not a diagnosis. Thus, many people with disordered eating patterns may fit the criteria for other specified feeding or eating disorders. People with disordered eating behaviour deserve attention and treatment as they may turn into more problematic eating disorder and the risk of serious health problems. (Anderson 2018) The risks associated with disordered eating are a clinical eating disorder, osteoporosis, fatigue, poor sleep quality, muscle cramps, depressive or anxious symptoms and behaviours and nutritional and metabolic problems. Disordered eating can have a negative impact on people life and reduce ability to cope with stressful situations as well as contribute to low self-esteem and social withdrawal. (National Eating Disorders Collaboration 2022)

People suffering disordered eating behaviour either minimize or do not fully realize the impact it has on their mental and physical health. Often people are unaware that their eating behaviour and patterns are problematic or harmful. The lack of understanding may unnecessarily aggravate the harm of disordered eating. In general, receiving help in early phase prevents the risk of the change from disordered eating to diagnosed eating disorder. Registered dietitian nutritionist are vital to detection and treatment of disordered eating. (Anderson 2018)

2.1 Relative Energy Deficit (RED-S)

RED-S refers to relative energy deficiency in sport, which is characterised by low energy availability due to a caloric deficit. It can affect both female and male, including elite and non-elite athletes. (Dooney 2020) The cause of RED-S is a long term imbalance in energy intake and the energy expended through exercise and daily life processes. Elite athletes are at risk of developing it by over-training combined with under eating and having pressures on body image in society with the need for being lean. (Sumner 2020) It may occur in individuals who are required to diet to

enhance performance, overtrain, are pressured to lose weight, have non-healing injuries or strict regulations (Seto 2019). RED-S may overlap the eating disorder and be the result or a risk factor for an eating disorder. By definition, the RED-S results from undereating. Disordered eating exist in the middle of continuum that ranges and appropriate balance between eating and exercise at the one end and a full clinical eating disorder at the other end. It can eater, be intentional nutritional restriction, or unintentional consequence of not matching an increase in energy expenditure stemming from and increased training loas with an increased energy intake. (Muhlheim 2020)

Studies shows that up to 25-50% of male or female athletes suffer from low energy availability, including physiological symptoms such as menstrual irregularities or low testosterone levels. Approximately 10-25% is due to an eating disorder or disordered eating behaviour. For this reason, prevention and early response are emphasized in the management of RED-S. (Heikkilä, Heikura & Löfberg 2020)

The danger of RED-S is instead of symptoms, the lack of recognition of symptoms. This is because of the early symptoms of RED-S can, among other things, perversely enhance performance in the sort-term. Weight loss caused by excessive training and restrictive eating can result in faster times in a short while. (Dooney 2020) Relative energy deficiency affects body functions in less than a week. In the longer term, the effects are significant. The longer the energy deficient last, the more demanding the consequences and the recovery process are. (Heikkilä, Heikura & Löfberg 2020)

Physical symptoms and possible signs of RED-S can include stress fractures, significant weight loss, fatigue, dehydration, stomach and gut related problems and dizziness. In addition to health implications, RED-S develop also performance consequences such as reduced muscle strength, decreased endurance, increased injury risk, decreased recovery rate and coordination as well as impairments in judgement and concentration. (Sumner 2020) A key symptom of RED-S in female athletes is hypothalamic amenorrhea or the absence of menstruation. The disappearance of menstruation is often a welcome relief for female athletes from monthly cramps and mood swings, which all impact training and racing. The female body requires a certain amount of energy to regulate reproductive hormones, such as oestrogen, which is crucial for bone, cardiovascular and cognitive health. (Dooney 2020) Long term psychological impact of women’s fertility are also considerable. The negative impact of a reduction in male hormonal level is represented as a decrease in testosterone which can cause reduction in muscle mass, decreased libido, impotence, increased stress fracture and fracture risk and increased visceral fat. (Sumner 2020)

There is no fast lane to recovery in RED-S. Many of physical symptoms grow from a deeply entrenched mindset requires a focus on mental health. With the help of professionals, disordered eating habits will be faced and established with a plan to combat these unhealthy behaviours.

(Dooney 2020) Dietician and Nutritionist advice and guidance is paramount for the majority of RED-S treatment (Sumner 2020). Treatment should involve an increase in dietary intake or/and a reduction in exercise, starting from rest days and energy-rich food or supplemental drinks. Many athletes may need to take a complete break from training depending on medical consequences and eating issues. (Muhlheim 2020)

3 Eating Disorders

All eating disorders are serious mental illnesses with significant life threatening medical and psychiatric mortality and morbidity, regardless if an individual's weight. People with eating disorder have the highest mortality rate of any psychiatric disorder. Eating disorders can affect individuals of all genders, ages, ethnicities socioeconomic backgrounds and with a variety of weights and body shapes and sizes. People with eating disorder may not recognize the seriousness of their illness and may be ambivalent about changing their behaviours or eating. Eating disorders may present in variety of ways. In addition to the behavioural and cognitive signs, the following physical symptoms and signs can occur in a person with eating disorder as a consequence of restricting food or fluid intake, nutritional deficiencies, binge-eating, and inappropriate compensatory behaviours, such as purging. However, a life-threatening eating disorder may also occur without obvious physical signs or symptoms. Early recognition and intervention, based on evidence-based, developmentally appropriate approach lead by professionals is the ideal standard of care, whenever possible. (AED Committee 2016, 4-6)

One in six women and one in forty men have an eating disorder by early adulthood. Many people with an eating disorder are left without treatment, as only a third are identified in health care. In girls and young women, anorexia and eating disorders resembling its symptoms are common. They are characterized by weight loss, dietary restrictions, compulsive exercise, fear of gaining weight and body image disorder. In boys and men in particular, other specified feeding or eating disorders are the most common category of eating disorders with common symptoms such as compulsive exercise, unhealthy weight management measures related to sport, large weight fluctuations and binge eating. (Sílen 2021)

One of the most significant barriers to diagnose and treat eating disorders is the persistent public stigma towards individuals suffering from an eating disorder. Generally, individuals with eating disorders are more blamed for their illnesses than individuals suffering from other types of psychiatric illnesses. Eating disorders are still largely considered as a female disorder and usually male held more stigmatizing beliefs towards eating disorders than female. (Shoen, Brock & Hannon 2019, 293-294) Men may hide the symptoms for years only due to social stigma related to men with eating disorders. They may have a specific issues related to body dissatisfaction, muscle dysmorphia and eating disorder symptoms. However, disordered eating symptoms vary by gender. Although many men may restrict, binge and purge, they are less likely to engage in typical eating disorder behaviors such as vomiting and laxative use. Men use more likely excessive exercise as a compensatory method. (Stanford & Lemberg 2012, 428-434)

There are multiple predisposing factors that may increase a risk to get an eating disorder, such as genetic, environmental, biological and other factors (Hilbert, Pike, co. 2014). These risk factors may interact differently in different people. Individuals can have diverse experiences, symptoms and perspectives. (Neda 2022) Stressful life events or traumas, including exposure to physical or/ and sexual abuse, problematic parenting, negative affectivity or bullying are general psychiatric risk factors which may increase a risk for a eating disorder. Lack of self-confidence, shape and weight related concerns, dietary restrain and family history of an disordered eating are among the most well-established risk factors. Personality such as perfectionism has also documented to be a risk factor especially for bulimia and anorexia. (Hilbert, Pike, co. 2014) Social factors, such as weight stigma and appearance of ideal internalization as well as limited social networks might increase the risk for eating disorders (Neda 2022).

Protective factors for eating disorder development include high self-esteem, body appreciation, body image flexibility, and self-compassion. Protective factors have features in common such as constructive coping mechanisms, self-care and emphasize the focus on body functionally instead of appearance and the healthy relationship with food (Svantorp-Tveiten, Torstveit & co. 2021).

Eating disorders can be treated. Treatment may involve supportive psychotherapy and a range of psychological therapies and techniques that help people manage their eating disordered thoughts and moods while achieving the treatment aims with refeeding to the normal weight and establish ‘normal’ eating behaviours. People with eating disorders may need treatment in hospital during their recovery. Most people recovering from eating disorder relapse occur in the first two year after treatment, usually in stressful situations. Part of the treatment is the psychological treatment that helps to cope with stress, anxiety and dysphoric moods without using food and eating disordered behaviour. (Albraham 2016, 130)

3.1 Anorexia Nervosa

Anorexia nervosa is a psychosomatic disorder characterized by self-induced and maintained weight loss, which leads to progressive malnutrition (Manichi, Daini & Caruana 2009, 7). A person suffering anorexia nervosa will intentionally restrict their food intake as a way to help them to lose weight, manage emotional challenges, an unrealistic body image and an exaggerated fear of gaining weight. The person may associate food and eating with guilt. However, the disease can affect people differently. Dietary restrictions can lead to nutritional deficiencies, which can affect people’s overall health and result in potentially life threatening complications and a substantial risk of death. The anorexia nervosa often appears during a teenage years or early adulthood, but it can

sometimes begin in the preteen years or later in life. It can affect people of any sex or gender. (Brazier 2021)

According the diagnostic and statistical manual of mental illness diagnostic criteria for anorexia nervosa includes intense fear of gaining weight, food intake restriction and distorted body image. People with anorexia typically fear weight gain and dread becoming ‘’fat’’. They tend to eat less food than the body needs to function correctly. This may lead them with significantly low body weight compared to person’s age and height. Their distorted body image has to do with their perception of the body size. People with anorexia often have exaggerated views of their bodies, such as seeing themselves as overweight, even if they are dangerously underweight. (Cowden 2022)

Anorexia nervosa can begin from a harmless diet which ends up with non-controlled malnutrition with distorted body image. People with anorexia nervosa are usually socially isolated, unhappy, irritable and suffering depression, anxiety and insomnia. Typical early symptoms are changes on diet, avoidance of fatty and high-calorie foods. Portions are smaller, usually only vegetables and fruits and meals are performed alone with food rituals, such as eating foods in a specific order. Some individuals with anorexia nervosa are trying to lose weight with compulsive exercise, laxatives or diuretic medicines. Weight loss is associated with menopause in girls and women. Weight loss and hormonal changes increase the risk of osteoporosis. Hair may thin, break or leave and nails may thin or turn blue. Many physical findings such as persistent fatigue, slow pulse, low blood pressure, dizziness and fainting, cardiac arrhythmias, swelling of the feet or hands, dry skin, dehydration, frostbite or constipation are also reported in scientifically low weighted people. (Ruuska 2021)

Anorexia nervosa is a complex illness. People with normal appetites may be unable to understand what the people is experiencing. The image of ‘’bully sitting inside the brain of person with anorexia’’, manipulating their thoughts and taking over willpower might help to understand what is happening in peoples mind when having anorexia. (Treasure & Alexander 2013, 30)

3.2 Bulimia Nervosa

Bulimia nervosa is an eating disorder characterized by a cycle of bingeing and compensatory behaviors such as self-induced vomiting designed to compensate or undo for the effects of binge-eating. It is serious and potentially life-threatening eating disorder. (Neda 2022.) A person with bulimia nervosa might also try to compensate eating of large amounts by overexercising and fasting. It develops in a person’s late teens or early 20s in any sex. Bulimia nervosa has two main

symptoms, which are regularly eating a lot of food in short period, usually in 2-hour window and then taking steps to compensate the overeating, such as purging, fasting or doing a lot of exercise. People with bulimia nervosa often have a healthy body mass index. They may worry about gaining weight and experience social withdrawal and mood changes as well as anxiety and depression. Nutritional deficiencies, chemical imbalances and effects on the digestive system can lead to physical symptoms such as, bitter nails, dry skin, weakness, fatigue, dental problems, irregular menstruation, sore throat, acid reflux, kidney problems, muscle spasms, osteoporosis, an electrolyte imbalance, heart problems and dehydration. (Brazier 2021)

Signs such as skipping meals, uncomfortable eating around others and in public, disappearance after eating, hiding body with baggy clothes, unusual swelling of the cheeks or jaw area, extreme mood swings, hiding a large amounts of food or empty wrappers could indicate that a person has bulimia (Neda 2022).

3.3 Binge Eating Disorder, BED

Binge eating episodes are defined as a periods when someone eats an amount of food that is significantly larger than would be eaten by other people in similar circumstances. When these binge episodes become frequent and start to interfere to happiness, relationships and sense of self-worth, this kind of overeating may crossed into binge eating disorder. An important part of binge eating is the sense of losing the control over eating, like someone else has taken over the control. People with BED know that they should stop eating, but they are not able to. Eating during binges may be more quick than normal, feel numb, punishing or mechanical and lead beyond the point of fullness and into a place of physical discomfort. Binge eating disorder involves negative emotions around eating. Common sign of binge eating is a desire to eat alone due to embarrassment of binges. Even the food may be bought from several places to avoid being seen with a large quantity of food. Following the binge eating episode, people may feel disgust, depression or remorse and promise to never binge again. (Marson, Keenan-Miller & Costin 2020, 2-5) Unlike in bulimia, after a binge, people don’t regularly compensate for extra calories eaten by vomiting, exercising excessively or using laxatives. They may try to diet or eat normal meals, which may lead to more binge eating. (Mayo Clinic 2018) Binge eating disorder is not a failure of willpower or actions just about food. It is about emotions, thought patterns and even relationships. (Marson, Keenan-Miller & Costin 2020, 2-5)

Binge eating is strongly associated with substantial weight gain, which can lead to increased obesity and various physical and psychological health problems, such as non-insulin dependent

diabetes mellitus, heart disease, depression and anxiety. (Alexander, Goldschmidt, Grange & Le Grange 2013, 36-39) Binge eating disorder is more common in women than in men and it often begins in the late teens or early 20s (Mayo Clinic 2018). Eating patterns in BED are chaotic, irregular meals and snacking. The initial goals of treatment is to regulate eating by a regular pattern of regular meals and snacks per day. (Alexander, Goldschmidt, Grange & Le Grange 2013, 36-39)

3.4 Other Specified Feeding or Eating Disorders

Other specified feeding or eating disorder are the most common category of eating disorder encountered in routine clinical practice. It is the category of eating disorders clinical severity that do not meet diagnostic criteria for either one of the two eating disorders recognized in diagnostic and statistical manual of mental disorders, anorexia nervosa or bulimia nervosa. However, most cases have clinical features that closely resemble those seen in anorexia and bulimia nervosa at slightly different levels or in different combinations. (Fairburn & Bohn 2005)

A diagnosis in other specified feeding or eating disorder might be assigned that addresses the specific reason why the presentation does not meet the specifics of another eating disorder. For example; atypical anorexia nervosa where all criteria are met, except significant weight loss or low frequent bulimia nervosa and low frequency binge eating where all criteria are met, except that the binge eating in bulimia nervosa and compensatory behavior and the binge episodes in BED occurs at a lower frequency. (Neda 2020)

The signs and symptoms of specified feeding or eating disorder may occur constant thinking about food and disturbance of emotions related to eating. Eating behavior can range from fating, binge and normal eating. Just like in anorexia, bulimia and binge eating disorder, people spend a lot of time and energy monitoring their eating, weight and appearance. Behavior is associated with shame, self-loathing, anxiety and secrecy in the same way than as in eating disorders meeting the diagnostic criteria. (Lahti 2019)

Orthorexia nervosa

Orthorexia nervosa is defined as a fixation on healthy eating and is characterised by an excessive concentration on food preparation, quality and rigorous standards of nutrition norms (Niedzielski & Kazmierczark-Wojtas 2021). In contrast to anorexia nervosa, bulimia nervosa and binge eating

disorders ,people with orthorexia nervosa focuses on quality rather than on the quantity of food. Orthorexia nervosa has not been recognized as a disorder by the fifth edition of the diagnostics and statistics manual of mental disorders, because of the lack of diagnostic criteria. It goes under unspecified eating disorders. (Valente 2020)

People suffering orthorexia eliminate products containing preservatives, colour additives, food flavouring, excessive fat, salt, sugar or genetically modified food from their diets. Individuals have their own list of an acceptable foods which may vary. Food is prepared with attention and utmost care and any deviation from imposed norms leads to a feeling of shame, guilt and further dietary restrictions. (Niedzielski & Kazmierczark-Wojtas 2021) Orthorexia nervosa may start from allergies or avoidance of certain products. Typical sign of orthorexia is a strong individual need to control things by perfectionism and anxiety. The main goal is the ideal state of health, which can lead to obsession and weight loss and end up to anorexia nervosa. People with orthorexia nervosa may seek a feeling of control and security from restricting the quality to food to get the feeling of control to their lives. One sign of orthorexia nervosa may be the special interest of supplements, vitamins and the labels of food packages. (Suorsa & Tolonen 2016, 15)

4 Disordered Eating and Eating Disorders in Sports

In many sports, body composition and body weight are crucial factors for performance. Many elite athletes battles with disordered eating and eating disorders as they attempt to adapt to the ‘’ideal’’ body in their sport. Constant restricted energy intake and low energy availability with or without disordered eating or eating disorders are associated with changes in the endocrine system affecting metabolism and function of many body systems both in male and female athletes. There may occur the rage of effects on athletes immune system, cardiovascular health, muscle protein with functional outcomes such as increased illness and injury risks and impaired performance. (Melin, Torstveit, Burke, Marks and Sundgot-Borgen 2014)

In some sports athletes seem to be more at risk to development of disordered eating behaviour or eating disorders because of the focus on weight categories, a thin prepubertal appearance or a clearly defined muscularity with low percentage of body fat. Sports such as synchronizes swimming, diving and gymnastics are aesthetically judged sports with emphasis on a lean appearance and can be labelled ‘’leanness-demanding’’ sports. Athletes participating in endurance sports, such as distance cycling, running and swimming also battle with issues with weight and body composition. (Melin, Torstveit, Burke, Marks and Sundgot-Borgen 2014) Study has shown that 35% of female and 14% male endurance athletes have some symptoms of eating disorders during their career (Heikkilä & Charpentier 2020). As well as in jumping events, such as ski-jumping and other jumping events the risk is high, where excess body weight has a disadvantage (Currie 2010).

There is also a growing concern in the appearance of eating disorders in athletes, especially in sports grouped into weight categories, such as a lightweight rowing, wrestling, judo and boxing (Melin, Torstveit, Burke, Marks and Sundgot-Borgen 2014). Symptoms of eating disorders have found from 38% of female and 49% of male in weight category sports (Heikkilä & Charpentier 2020). Recent studies have indicated that many athletes use unhealthy methods and strategies to control their weight, especially in pre-competition season. These methods and strategies include vomiting, food and water restrictions and included sweating. Often, these strategies are not seen as a potentially harmful by the athlete and may even recommended by the coach. Therefore, education, identification and prevention of eating disorders are crucial to the athlete and their coaches. (Rodríguez, Salar & co 2015)

It is not surprising that disordered eating behaviour and eating disorders are found in sportswomen and men. Eating disorders are even more common in sports where weight has a massive effect on performance. There are three principal reasons why. Firstly, in endurance sports leanness is related to performance for obvious physiological reasons. For example in long-distance running,

runners who are several kilograms over their optimum performance weight will perform less successful. Secondly, in weight category sports such as boxing, athletes will not be allowed to compete if their weight is upper or above the limit for the category. This may create pressure to achieve the necessary weight loss in very short period of time. Thirdly, in sports such as gymnastics, an aesthetic evaluation is attached to particular body composition which is then encouraged and promoted in athletes. (Currie 2010)

4.1 Sport-Related Predisposing Factors

Athletes are viewed nowadays in the society as idols of healthy lifestyle and generally as good role models for young people. In spite of that, sport is always not as it may appear. It has its own risks and negative outcomes on both physical and mental health on one of the harmful consequences are eating disorders that athletes may face. Study has shown, that athletes are more prone to develop eating disorders. Elite athletes are committed to live for sport and devote the time, money and energy towards the goals and skill development. They may also face difficulties with balancing sport career and life and be prone to problems regarding anxiety, perfectionism or eating disorders. (Ismailova 2016) ‘’Good’’ athletes and eating disorders have similar characteristics. Although, this does not mean, that ‘’good’’ athletes are pathologically related or similar to eating disorder patients. ‘’Good’’ athletes are athletes who not only perform well athletically but also possess attributes a coach values. Athletes who work harder and longer than others, denies pain and injury, are selflessly committed to the team, are satisfied with nothing less than perfection and are willing to lose weight to perform better. They have mental toughness, commitment to training, pursuit of excellence and unselfishness. For comparison, anorexic individuals have asceticism, excessive exercise, perfectionism and selflessness. Both, good athletes and anorexic individuals can denial the pain and perform in discomfort zone. (Thompson & Sherman 2010, 66)

Aesthetic sports such as gymnastics, ice skating and ballet, where the physical appearance plays a crucial role may predispose to development of eating disorders. (Ismailova 2016) Studies shows that 27% of female and 14% of male athletes in aesthetic spots have eating disorder symptoms (Heikkilä & Charpentier 2020). Elite athletes form aesthetic sports have higher risk, especially in order to get thinner to increase the performance and be under the environmental pressure, to develop eating disorder. Athletes with eating disorders are engaged in disciplines where weight control is central. Female athletes are more than twice at risk for developing eating disorder that male athletes and usually during adolescents and young age, because they are extremely sensitive to environmental influence on that age. (Ismailova 2016)

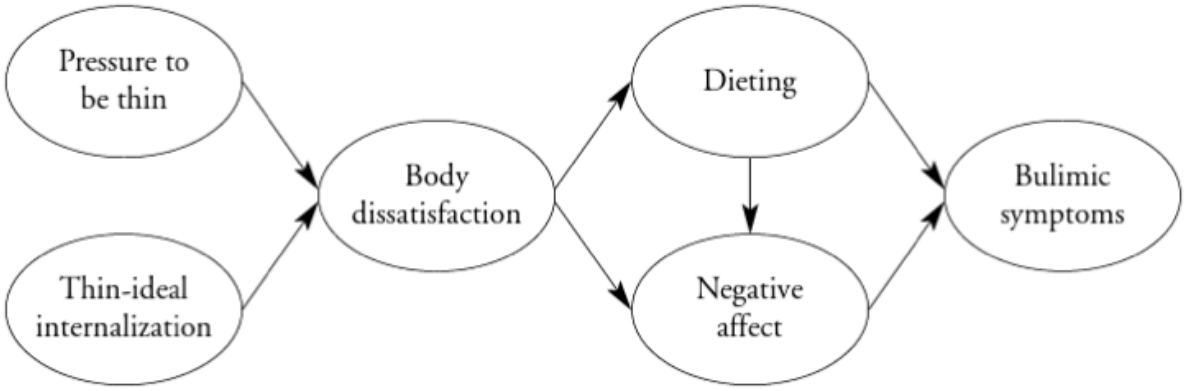

FIGURE1. Theoretical components of the dual pathway model of bulimia pathology (Stice & Presnell 2007, 11)

Ismailova (2016) present a study on 522 elite female athletes who were asked if they had suggestions why they developed eating disorder. 34% of the elite athletes reported prolonged period of dieting, 30% change of a coach, 23% injury or illness as a reason, and 19% casual comments about weight as a triggered factor. The reasons behind dieting is usually the enhance of performance and in some cases it may be recommended by coach or relatives. As the study concludes, the social factor plays a critical role in development of eating disorders. (Ismailova 2016) Athletes may also have individual genetic and/or psychosocial vulnerability, socio-cultural pressures relating to food, body image and diet as well as non-specific psychological stressors as a trigger factor (Currie 2010).

As previously said, female athletes, athletes of weight depend sport, athletes who scored high or negative emotionality, male athletes competing in endurance, technical or power sports are in high risk for developing eating disorder. (Ismailova 2016) Other factors such as the revealing nature of much sport clothing, the intense competitiveness of sports participants, specialisation in one sport at an early age and suddenly increased training volume, have also been described (Currie 2010).

4.2 Identification

Eating disorders are not easy to identify. Identification is necessary part of the process leading to recovery. Even if the physical manifestations of anorexia nervosa may be clearly evident, the related disordered eating behaviours are likely to be kept secret. Individuals suffering bulimia nervosa are usually having normal physical appearance and like in anorexia nervosa, eating behaviours will be kept hidden. In the world of sports, an athlete whose body composition results from anorexia nervosa rather than athleticism may be hard to spot. Athletes may be also expected and encouraged to eat in unusual way. It may be difficult to recognise ‘’athletic’’ from ‘’disordered’’ eating. However, some distinctive characteristics have been describes, such as ‘’athletic’’ eating is more likely to be directed towards improved performance rather than weight loss and altered body shape with more emphasis on what need to be eaten. (Currie 2010) A typical sign of disordered eating behaviour is an attempt to eat less and less food. In addition, athletes may narrow down their diet by constantly giving up new foods. In the early stages of weight loss, athletes well-being and performance often improves for a while until deficient energy begins to show. Performance begins to decline as the athletes increase the time spend in training. (Heikkilä & Charpentier 2020)

In some sports the body mass index measurement or body weight can be unreliable indicator of potential eating disorders. Muscular athletes will be heavy although lean and if they start to lose weight they may not meet all the diagnostic criteria for anorexia nervosa until the condition is advanced. Therefore, it is important to focus on athletes absolute weight, progressive changes in weight and dietary intake. (Currie 2010) The easiest way to begin the identification process of athletes is perhaps with a simple checklist of signs and symptoms of eating disorders and disordered eating. A checklist will work as a screening measure, but as with most checklists, one symptom does not indicate the presence of disorder. The number of observed symptoms however, increases the risk of disorder. (Thompson & Sherman 2010)

TABLE 1. Checklist of signs of eating disorder (regardless of the amount of exercise) (Heikkilä & Charpentier 2020)

Constant focus on food, exercise and weight loss	Constipation, abdominal pain
Rapid weight loss	Menstrual disorders (delayed menstruation, irregular cycle)
Frequent weighing	Delayed puberty
The requirement to have food that deviates from the diet of the rest of the family	Low blood pressure, high heart rate
An unhealthy diet or avoidance of certain food groups (e.g., carbohydrates)	Fluid imbalance
Excessive or compulsive exercise or stress if unable to move	Weakness, dizziness, light-headedness
Distorted body image	Palpitations, arrhythmias
Repeated toilet visits after a meal	Easy bruising
Depressed mood	Sensitivity for cold, frostbite
Increasing social withdrawal	Cold limbs, bluish
	Dry and pale skin
	Enamel damage to the teeth, signs of forced vomiting

Signs and symptoms especially typical for athletes should be closely monitored. Symptoms typical for athletes are continuous, compulsive monitoring of food, energy and weight, distorted body image and dissatisfaction with the body, strong effect of weight on self-esteem, compulsory adherence to exercise program and diet and disproportionate anxiety about performance failure. Athletes with eating disorder may believe that they become worse and fail if they gain weight. This can manifest in behaviours such as refusing to weight in, being obsessed with food, or having morbid fear of gaining weight. Athletes with an eating disorder often exceeds the recommendations in trainings, given by the coach. They have difficulties to keep days off. The decline in performance caused by starvation makes athletes to train even more. Excessive training can also be related to the compulsive need to consume a certain amount of energy while exercising. At the same time, failure affects to athletes self-esteem and the mood begins to be anxious and depressed, which

may show as anger, crying, irritation and withdrawal. The failure for athletes with eating disorder means not only failure in performance but also failure as a person because their ability to put failure into a boarder perspective is impaired. (Heikkilä & Charpentier 2020)

Athletes with a possible eating disorder should be approached directly, supportively and confidentially. They will need a more detailed medical and if necessary psychiatric evaluation. This will clarify a problem and what action is required. (Currie 2010)

4.3 Recovery

Athletes with eating disorders can deny having any problems. They see their dieting as a positive thing because it gives them a feeling of self-esteem, identity and control. Extreme dieting helps them to reduce the negative emotions and stress. Although, athletes identify their problem and want to recover from negative consequences of eating disorder, they are afraid of gaining weight and losing control. In spite of, most motivating strategies for eating disorder patients are directed at improving the food intake and weight, which feels very threatening for individuals suffering eating disorders. A better strategy is to motivate athletes to focus on reducing the negative physical consequences and to improve their self-esteem, body attitude and coping strategies. Usually, when the negative consequences become very serious, individuals realize that they cannot continue that way of life. Some individuals may realize that they have to choose between life and death, which is a turning point for recovery. Although, there is a huge cap between recognize the eating problem and become motivated to change. The fear of gaining weight and getting back the problems before eating disorder, such as low self-esteem, negative body image and inability to express the emotions and needs, is dominant. All these fears and doubts affect to the motivation and makes it to change highly ambivalent. In this stage of ambivalent motivation, athletes will need much support from parents, coach, siblings, friends to overcome the fears and ask for help. (Noordenbos 2013, 43-49)

The early stage identification and diagnose can ease the recovery. Parents, coaches, athletes and general practitioners have to become sensitive to the risk factors and first signs of an eating disorders. After identifications, the next step is to find adequate and effective treatment as soon as the first signs of eating disorder are noticed. After the treatment, a long period of aftercare is necessary in order to reduce the risk of relapse. Some individuals with eating disorder relapse. In that sense, it is important that family and coaches recognize the first signs at an early stage so support for the problem can be reach at the earliest. (Noordenbos 2013, 142)

Research has clearly shown, that in effective treatment of eating disorder, the body and mind cannot be separated but are closely related and function as an integrative system. Treatment directed only at recovery from the physical consequences is ineffective, because individuals continue to have disturbed cognitions about weight and food and remain obsessed by weight and food. Either, the therapy directed only at changing cognitions without improving food intake and weight ins not effective. If the body of athletes with eating disorder is in a very bad condition because of severe starvation, they cannot think clearly and thus psychotherapy is ineffective before balancing the nutrition levels. (Noordenbor 2013, 58)

Athletes with anorexia nervosa, one of the most difficult problems is to reduce the fear of increasing food and weight. For bulimic athletes, reduce of the number of binges and to learn to eat normal amounts of food without vomiting, using laxatives or exercising, is important. Psycho-eduation about the need of food and the physical consequences of increasing food intake and weight is in a big role of recovery. For full recovery, athletes food intake have to become healthy and regular and all disturbed eating habits should be reduced. To be able to eat in a healthy way, the factors underlying the eating disorder have to addressed in the treatment. A major goal in recovery is for athletes to develop a positive body image and learn to accept their body with focus on the positive aspects of their body instead of negative aspects. The improvement of self-esteem and self-respect as well as the healthy strategies to cope with negative emotions, are also a key factors for a full recovery. Athletes with eating disorder may need to learn that they have to accept the negative emotion and to express them, rather than avoiding and hiding them. (Noordenbor 2013, 59, 74, 101,113)

Some eating disorders can become chronic. In addition, many individuals can expect to make a good functional recovery, if identification of problems have done early. Athletes may resume in spot participation, if they have progressed in therapy and treatment. The first step and as a recovery process is to return to a light training. A graded return continues with progressed increase of training load until athlete is ready to return to competition. Return to training should be done with close co-operation between the therapist and coach. There are four important factors to consider when planning a rehabilitation program for athlete recovering from eating disorder. In order of priority; medical stability, nutritional stability, abstinence from eating behaviours and consideration of the psychological stresses that may exist in sport environment and cause a relapse. In some cases, if needed, athletes may need to consider to leave the sports environment and get all the support for that decision. (Currie 2010)

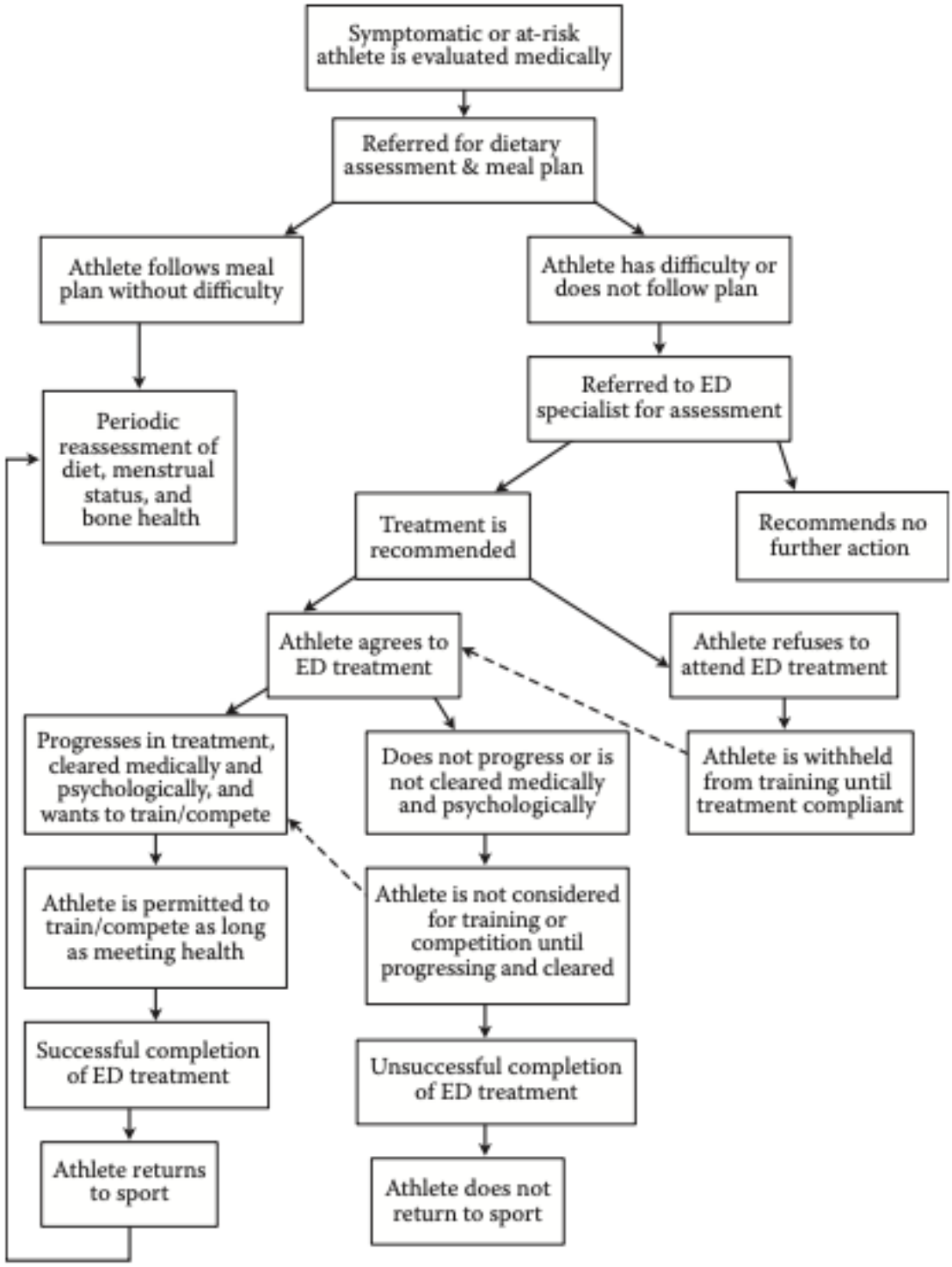

FIGURE 2. IOMC decision tree for managing disordered eating (Thompson & Sherman 2010, 120)

4.4 Prevention

Specific strategies to prevent athletes eating disorders can include surveillance, research and public and professional education (Melin, Torstveit, Burke, Marks & Sundgot-Borgen 2014, 183). Preventive efforts can be divided into primary and secondary preventions. Efforts aimed at early identification and treatment involve secondary prevention. In primary prevention the goal is to decrease the incidence of eating disorders by decreasing exposure to risk factors and by increasing exposure to protective factors. Genetic factors cannot be changed, so the focus should be in other risk factors. (Thompson & Sherman 2014) Athletes, coaches and health care teams should be aware of triggers, such as a sudden increase in training volume or injuries, and prevent restricted eating behaviour and dieting, and emphasize the adequate nutrition in these situations. (Melin, Torstveit, Burke, Marks & Sundgot-Borgen 2014, 183)

One of the most important prevention of eating disorders among athletes is the continued emphasis on the purported relationship between weight or leanness and performance. The suggest is that weight is not the critical factor, or at least there are other important factors that contribute to successful performance. The idea of ‘’ the leaner athlete performs better’’ should be avoided. In fact, some athletes perform less well after losing weight or body fat. Good performance should be enhanced through health, nutrition and practices. (Melin, Torstveit, Burke, Marks & Sundgot-Borgen 2014, 204-205)

In primary prevention athletes should be educated as to the early establishment of good eating habits and training practices, in addition to developing positive body image and positive self-esteem. The knowledge of body health, unique body shape and size as well as restricted pressures to diet and be physically active should be shared with athletes in young age. Eating and nutritional information should involve the healthy balance between eating and physical activity with a balanced energy intake. The best way to get athletes attention is to talk about performance. The information provided to athletes about healthy eating habits should indicate that it can increase the performance. The consciousness of athletes critical thinking between nutrition and performance should be increased. (Melin, Torstveit, Burke, Marks & Sundgot-Borgen 2014, 185-192)

Measurements of weight and body composition should be performed in context of other relevant sport-specific performance tests to prevent focus on body weight and composition as the only performance enhancing factor. Optimal targets for weight and body composition should be set individually, because excessive leanness might compromise health and performance in one athlete, but enhance performance in another athlete without adversely affect in health. (Melin, Torstveit, Burke, Marks & Sundgot-Borgen 2014) In some sports, athletes will have an optimum performance weight that is different for training and competition. Weight manipulation should be

supervised and supported by low risk strategies. Weight loss is least risky if it is done under supervision and with agreed target in mind. (Currie 2010)

Coaches can contribute to reducing the eating disorder risk. An environment in practices should be supportive and encourage athletes to do their best instead of criticism (Currie 2010). The focus on weight should be minimized and athletes should be encouraged to practice training regiments and eating behaviour that promote optimal performance. (Melin, Torstveit, Burke, Marks & Sundgot-Borgen 2014)

Parents have also their own role on prevention. The example set by parents of healthy eating behavior and exercise is very important to young athletes. Parents should remember, that in addition to comments addressed directly to young athlete, also the parents speaks is preserved and remembered. Repeated criticism of other's body weight, type or appearance by parents can affect critically on the development of young athletes body images. (Heikkilä & Charpentier 2020)

In addition, it is really important to remember the effects of social media to young athletes body image and self-image. Social media is a risk factor for a young athletes. They are prone to comparison and wrong advices and guidance. A young athletes can adopt their athletic role models, embracing their body types and extremely healthy eating tips to achieve their own. Athletes should be educated to critical thinking towards the material seen online. (Heikkilä & Charpentier 2020)

5 Role and Responsibilities of Coach

The role of coach in preventing and identifying disordered eating behaviours is important. However, identification is not easy, as eating problems are often hidden and forbidden. In a strong athlete-coach relationships, athletes trust their coaches. Therefore, coaches example related to weight and appearance is important. The sooner potential eating disorders are addressed, the sooner the recovery and treatment can be started. Interfering with athletes eating behaviour can be awkward, even if the coach realizes unhealthy behaviour. It can seem too personal, and finding the right words or the right time might feel difficult. Coaches may face questions about whether that situation belongs to them and whether it would be appropriate to tell the athletes parents about it. (Heikkilä & Charpentier 2020)

There are several reasons why coaches should be involved in the management of athletes eating disorders. Coaches may be a good management team choice because they spend much time with their athletes at practices, competitions and traveling. That gives them opportunities to observe, monitor and support athletes. Most important, coaches have significant influence and power to athletes. Having coaches formally involved in eating disorder management and treatment process may increase the likelihood of their positive participation regarding future risk or symptomatic athletes. (Thompson & Sherman 2010, 111)

5.1 In Identification and Approach

Early identification in eating disorders is important. Recovery can be facilitated and the earlier the individuals get support, the lower the health risks are. Coaches are in a good position to identify disordered eating behaviour by the way their regular and close interactions with athletes. Being aware of the signs and symptoms of disordered eating and eating disorders can help coaches to detect early warning signs. Coaches should identify athletes who may be struggling and take steps to support the recovery. As well as knowing the signs and symptoms, it is important to know how to get support for an athlete. Coaches should encourage help-seeking for mental health concerns, including eating disorders. Approaching an athlete with a suspected eating disorder is never an easy task. (Embrace Performance 2020)

The person designated to talk with the at-risk or symptomatic athlete should have some authority in the sport environment. More important is that the person either have a good relationship with athlete or, at least be confident and comfortable discussing sensitive and important issues. That person could be a coach, athletic trainer or physician. In fact, who approaches the athlete is less

important than how that person is approached. The biggest mistake made, is to respond to athletes in an insensitive or judgemental manner or imply the difficulty to trivial or a sign of weakness. The timing of the approach can be as important as what is to be communicated. Individuals should be approach privately, so the likelihood of embarrassment and discomfort can be minimized. The concern about athlete's health and welfare should be told without being too specific regarding the symptoms. Specific symptoms can be easily fended off or denied and felt too threatening for athlete. If athlete question the concern, then the concern involving eating or nutritional status can be told. However, less directed inquiries regarding whether decreased sport performance or difficulty to comply with the physical sport demands, can be more helpful. As a consequence of the conversation, an evaluation with a medical specialist should be arranged. (Thompson & Sherman 2010, 114-115) By reason of athlete's own opinion, that there is nothing wrong with her or his eating behaviour – at least that she or he would not be able to solve herself or himself, an athlete can either deny everything or get really angry. Anger often arises from fear. That kind of strong reaction often makes the environment around the athlete silent from the situation until the eating disorder has evolve strongly. The emotions of the athlete should not be feared in the way, that it affects to approaching. Even if it is hard for athlete to hear the concerns of other people, the repetitive message leaves a desire for recovery, which gradually can grow into a courage to recover. In some cases, athlete may be relieved to get noticed with eating disorder. Approaching the problem, can remove the heavy burden of secrecy from athlete. (Heikkilä, Kuivalainen & Charpentier 2020)

Evidently, approaching the athlete identified with eating disorder symptoms can occur several scenarios. Ideal response will be positive and athlete will accept the evaluation referral. In cases, where athlete express reluctance or refuse the evaluation, she or he should be told, that until properly evaluated is done, she or he will be considered to be ''injured'', and that injured participants must be cleared for practices and competitions by appropriate healthcare professionals. Additionally, the athlete should be told that, temporary suspension from practices and competitions is not a punishment. Instead, it is a statement regarding athlete's health over the sport performance. Maintaining an attachment to the team or training group, athlete should not be suspended from team meetings and practices, even she or he cannot practice before evaluation. Withholding sport participation can eater motivate athlete eventually agree to evaluation, if she or he wants to participate in sport or make she or he to refuse to return to sport. Overall, getting the athlete to the medical evaluation is the initial goal. (Thompson & Sherman 2010, 116-119)

When approaching the athlete as a coach, the coach should plan beforehand what, when and where he or she going to talk with the athlete. The coach should point out, that he or she cares about the athlete and therefore want to talk about something important. I-statements should be

used instead of you-statements at the beginning of approach. Athlete's perspective of the situation should be asked carefully and provide space for athlete to share her or his emotions and feelings openly. Conversation should remain open in the way, that athlete is able to decide what he or she wants to share. The coach should give positive feedback for athlete about sharing. Overall, it is not coach's responsibility to work as a therapist for athlete. As a coach, your job is to guide the athlete to professional evaluation and support the athlete through the process. (Heikkilä, Kuivalainen & Charpentier 2020)

When a coach identifies or suspects that a young athlete is having symptoms or signs of eating disorders, it is really important to contact athlete's parents immediately on findings. The co-operation between the coach and parents helps to share responsibility of the situation. If the athlete is an adult, she or he should be motivated to tell someone about the situation. In cases, when athlete denies the coach to contact the parents, the contact can be postponed until the athlete is ready. However, if the situation is already serious, the contact cannot be postponed. In this case, the collaboration with young athlete is important if it is possible. The adult must take responsibility and act as the situation requires, even if it may make the young athlete angry with the coach. Once the acute situation is over, most of the cases, the athlete is grateful of intervention, because she or he realizes where the situation coukd have lead them without appropriate treatment. (Heikkilä, Kuivalainen & Charpentier 2020)

Coach – Athlete Relationship

The coach-athlete relationship refers to all situations where coach and athlete's thoughts, feelings and behaviours are inter-related. A strong coach-athlete relationship is linked to enhanced performance, superior self-concept and happiness. In the sport psychology literature, the most frequently cited coach-athlete conceptual model is Jowett's 3+1 Cs framework. This framework includes four constructs, which combined represent perceptions of the overall relationship quality between a coach and an athlete: closeness, commitment, complementarity and co-orientation. (Nicholls & Perry 2016) The first C, closeness, defines as mutual trust, respect and emotional connection between a coach and an athlete. It is considered the emotional component of relationship and is highly personal and subjective. Closeness between athlete and coach will fade without continued effort to nurture the feeling and attachment needed to build mutual trust. A coach can nurture closeness with athletes by appropriate and positive touch, such as high fives and chest bumps. The second C, commitment is described as the cognitive component of relationship. Commitment is a conscious choice to invest energy and time into sustaining the connection over time. The third C, complementarity captures the degree where athlete and coach are willing to co-

operate and share efforts to achieve target outcomes. It requires compassion and empathy from coach and athlete, because the must be willing to consider alternative views and engage in constructive and friendly dialogue. The last +1 C, refers to co-orientation, which is the degree of relationship perspectives held by coach and athlete in agreement. If co-orientation is low, on person's views do not match the perceptions of how the other person views the relationship. (Gilbert 2017, 77-79)

Athletes success is mostly measured by overall victories. Success through the victories does not make athletes great until it is paired with effective coaching, which runs deeper than wins and losses. Effective coaching also includes athletes individual levels and growth as a positive, ethical and moral person. Athletes success without effective coach-athlete relationship produces athletes with ability, but with no personal growth. The challenge of coaching is balancing logic and rational along with emotional and empathy awareness. Coaches who want to connect with athletes need to be empathetic and understanding. They must accept, respect and support athletes as well as people around them. Coach is a role model for young athletes 24/7, because young athletes are susceptible to the effects of their surrounding environment and to the ideas of others. Coaches should be aware that their job is not just about physical progress, it is to educate the athletes how success in life. A lack of interest, deceit, remoteness, pessimism, apathy and irritability are key characteristics to avoid as a coach. Approachable and interested coach is easier to athletes to approach. An open communication and positive competitive environment leads to physical and personal growth. (Gels 2017)

Coaches should never forget that they are coaching people first and the sport second. The most effective coaching strategy is communication. Coaches should check regularly in with each athlete and update on their lives. Chatting can be done e.g., a few minutes before practices for social times to allow athletes to speak about their lives while they are starting to warm up. Good relationship works in both ways, coaches must also share with athletes to earn their trust. Ultimately, building a relationship between a coach and an athlete is an act of courage, for both the athlete and the coach. (Gilbert 2017, 77-79)

Respect, trust, belief, support, co-operation, communication and understanding are considered among the most important coach-athlete relationship components that contribute to performance success and satisfaction. In contrast, lack of respect and trust, excessive dominance and blind obedience as well as physical, verbal and sexual exploitation are considered to be components that undermine coach-athlete relationships' welfare. Coach-athlete relationship may change over time in response to the dynamic quality of human emotion, behaviour and cognitions, shaped through the interaction of the members on relationship. (Jowett & Lavallee 2007,4)

5.2 In Recovery and Treatment

A unique finding on research has shown that athletes are most frequently helped by a desire to regain energy or health to participate in sport. Reduced sport performance is a unique recovery motivator for elite athletes, which represent a clear difference from non-athletes. Based on the given information, a useful treatment strategy for athletes would be to help them to identify and explore sport related goals that are jeopardized by the eating disorder. That may enhance treatment motivation. The second helpful factor paired with professional treatment, new coping skills, changing environments, in athletes treatment is the support from others. Athletes should have strong social network around them including the coach. The coach should work to encourage and foster athletes' motivation for recovery and compliance to treatment. Moreover, coaches responsibility is in prevention related to sport performance and the risks of eating disorders. At some cases, the fear of embarrassment may be enough to motivate recovery. Alternatively, this may relate to the unique dynamics as part of the team or worry of discovery by others, which could jeopardize athletes position on team. (Quatronomi 2014)

What is needed most by the athlete suffering eating disorder is a sense that others appreciate not only the difficulty but also the complexity of the tasks of recovery. If coach is underestimating the enormity of the recovery tasks, is he or she unlikely to be experienced as helpful. The coach should understand that athletes may feel less safe after gaining some weigh in recovery and validate them that there is more to recover than only the weight. (Palmer 2014, 89) It is recommended, that coach sets a good example by being positive role model for healthy living and self-acceptance and avoids dieting or making negative statements about his or her own body or eating habits to someone going through the treatment. The coach is responsible to learn about eating disorders to be able to understand the complexities of the disorders and recovery process. Athletes should be heard without lecturing. The coach should praise the athlete often enough and stay positive even through setbacks and provide the unconditional support that the athlete needs to make a full recovery. The coach should work together with professionals treating the athlete and ensure the acess to nutrition and psychic coaches. (Zeigler 2010)

Athletes can continue training, if eating disorder behaviour is mild and controlled. Even early and mild signs and symptoms are associated with too low energy intake or unevenly distributed energy intake on daily basis. For this reason, it is justified to ease the training. Intensive exercises can be detrimental rather than beneficial to the athlete with disordered eating in terms of physical performance. Intensity should be reduced and endurance athletes should avoid long runs because of the high energy consumption and thus the nature that aggravates the symptoms of eating disorders. Athletes with medical justifications, such as body mass index below 17, clear signs of

fatigue after short workout, arrythmias or other serve somatic symptoms or fainting during training should have a break from training. The concern of the coach about athlete may also be a reason for suspending the training. The doctor should be consulted about continuing the practices. In some cases, continuing exercise maintains pressures that exacerbate anxiety and eating disorders. The coach should work with the athlete's doctor and the rest of the health care team. Athlete is able to return to the practices only with doctors permission, if the situation have led to suspension. (Heikkilä, Kuivalainen & Charpentier 2020)

5.3 In Prevention

In addition to prevent disordered eating and eating disorders in sport, the coach should promote healthy and appropriate practices among athletes. The factors of improved athletic performance, such as genetic gifts, muscle mass and training motivation teamed with good nutrition and proper hydration should be highlighted for athletes. Practices should involve fun, fitness and healthy competition with realistic goals to avoid physical and mental burnout. Athletes should be motivated to make the most of their ability and their sport experience by encouraging good nutrition and healthy training with ability to relax and be flexibility in workouts. The coach is responsible to encourage athletes to strive for balance between exercise and other activities, and also between exercise and eating. Athlete's sport is a lifetime pursuit, which means caring for their bodies over a lifetime. The athletes should be remind to have only one body, so they behoves to take good care of it. Rest days and the need of sleep should be educated to athletes, as well as the knowledge of overtraining. (NEDA 2022)

It is important for coach, to be aware of her or his own food and fitness attitudes and behaviours, because young athletes may copy the example of the coach. The coach should understand her or his role in promoting a positive self-image and self-esteem to athletes. The coach should eliminate derogatory comments or behaviour about weight and understand, that weight is a sensitive and personal issue for many women. Athletes performance should be celebrated by talents and strengths beyond the physical; developing body, mind and spirit. (NEDA 2022)

Athletes education providing with accurate information regarding weight, weight loss, body composition, disordered eating, eating disorders, nutrition and sport performance in a context of reducing misinformation and unhealthy practices, should be scheduled as a prevention. (NEDA 2022) Athletes, especially young athletes should understand, what the diet that supports performance, development and recovery includes, in sense of being able to follow that. It is important for athletes to understand the energy requirements of the sport. The coach should have

a basic knowledge of nutrition, so he or she can be able to educate and supervise athletes nutrition. (Heikkilä, Kuivalainen & Charpentier 2020)

To ensure prevention, the coach need to know those risk factors that are common to the sport environment in general, an those that are specific on particular sport (Thompson & Sherman 2010, 196). The coach has an important role in young athletes lives. Athletes should be coached as individuals, not only as athletes. Biologicals, psychic and social needs of an athlete should be notices as well as physical needs. The coach should know athletes also outside of practices and treat them equally. The communication of coach should be considered and it is recommended that the coach does not talk to athlete about weight loss. However, if the coach decides to instruct the athlete to observe the weight, it is important to combine the detailed instructions, how to do so, to athlete. After all, it is important for coach to understand that athletes weight management and body composition are formed over the years as a combination of a healthy nutrition and exercise. Giving weight loss instructions to overweight athlete is not recommended. Overweighted athletes should be supported by healthy diet that supports the athletes health and performance, which at the same time also leads to slow weight loss. In addition, the athletes training program can be viewed. Again, there is no or place of weight talk. All of this also applies to the team’s or training groups internal discussion and attitudes about weight and body composition. The coach should constantly show a sensible approach to weight and nutrition. Also the remainders of critical view and thinking on social media should be constant. (Heikkilä, Kuivalainen & Charpentier 2020)

6 Online Pedagogy

Online learning is education that takes place over the Internet. It is the most popular form of distance education. Course Management System (CMS) software, such as Moodle, is used on online learning. It allows instructors to design and deliver the courses within a flexible framework that includes a number of different tools to enable communication and learning to occur. The most CMS include tools such as chat, schedule, announcements, modules. assignments, private messages and gradebook. Online learning meets the needs of an growing population of students who cannot or prefer not to participate in traditional classroom settings. Online courses provides an course delivery unbound by time or location allowing for accessibility at anywhere or anytime. It can also enhance learning in context of depth understanding and retention of content and emphasis on writing and technology skills as well as life skills like time management, independence and self-discipline. (Stern 2022)

In online learning instructor's role is changed from the ''sage on the stage'' to ''the guide on the side''. The pedagogical shift in online learning is how we teach and learn. The lack of physical presence in the virtual classroom must be compensated by an online instructor by creating a supportive environment where all students feel comfortable to participate with a right amount of information. (Stern 2022) While online courses is an effective way of imparting knowledge, it comes with its own challenges. Learning new skills. designing a session fit for virtual engagement, adopting a new approach that works for remote engagement and optimizing the use of technology are a few examples of what tasks facilitators are upskilling to. (Mishra 2021)

Good online courses include some sort of intake through reading, listening or viewing. Students should have opportunities to process what they have taken in, by discussion, reading or reflection. Usually, online courses require students to demonstrate that they have acquired new knowledge or skills in some way, by using different kind of test, and some activities that might looks similar to processing activities. One important distinction in online course structure is whether the activities will be synchronous or asynchronous. Synchronous includes instructor and student in the same place, whether a Zoom room or a face to face classroom at the same time. Asynchronous means that the instructor and students will be working on the same activity without fixed times and spaces for meetings. Most of the online teaching is asynchronous. (Johnson 2020)

Consistency should be provided in online course. Modules and activities should be clearly labelled with titles. Objectives of the course should be present. Time schedules of beginnings and due dates should be as clear as the information, where to find activities and materials. Images used on the course should not be copyrighted images or graphics. In case, the course contain reading material from library or from the web, instructor needs to make sure that everyone has accept.

Videos can be a highly useful tool to present materials to student. Instructor should provide the possibility for students to discuss whether with each other's or with instructor. Each activity should have some sort of feedback associated with it. (Johnson 2020)

7 The Aim of the Project

The main aim of this product based thesis is to raise the awareness of coaches in disordered eating and eating disorders in a field of sport. The goal is to educate students how to prevent disordered eating and take into consideration the predisposing factors on specific sports. After the online course, students should be able to identify the symptoms of different eating disorders and know how to approach the athlete with disordered eating behaviour and refer the athlete to treatment. Disordered eating needs to be made visible in sports, as it is more common than noticed. The lack of knowledge might cause even more cases. The awareness of a coach can speed up athlete's access to appropriate treatment. From other perspective, the aim is to help athletes to get the appropriate education of eating disorder and raise the awareness of disordered eating and predisposing factors. The awareness of athletes may prevent the development of eating disorders.

8 Project Planning

8.1 Commissioning Organization

The commissioner of the thesis is Haaga-Helia University of Applied Sciences, Vierumäki campus. The idea of this theses came from Haaga-Helia's teacher. Disordered eating and eating disorders have become more highlighted in sports. The basic knowledge of this topic is relevant for students in the field of sport from the point of view of prevention and early identification. Haaga-Helia's course selection didn't offer this type of education for students. They offered this topic for the author of the thesis, because of her nursing degree and work experience with eating disorder patients. The author wrote at her previous studies thesis about anorexia and created a treatment methods for that, so the topic is a target of interest of hers. The product for Haaga-Helia of this thesis will be added to the list of elective courses for students to provide the education of disorders eating and eating disorders in sports for coaches and the individuals working in the field of sport.

8.2 The Stages and Timetable

The project started on the spring of 2021 by the contact of the teacher of Haaga-Helia offering the topic of this thesis. The official start of the project was in April 2022 when the information retrieval and the planning of the structure of the project started. This thesis have a multiple online references including books and articles. The result of the project is an online course, for which most of the information should be found in Internet. The information has searched by using Haaga-Helia's online portal Finna, Google Scholar and reliable websites.

Theoretical part, which is the theoretical base and structure for the online course includes five different main topics, aimed at responding the aims of the project; disordered eating, eating disorders, disordered eating and eating disorders in sports, role and responsibilities of coach and online pedagogy. Haaga-Helia gave the autonomy for the author to design the structure and contents of the course. The final product is based on theoretical part with an addition of pictures and videos with copyrights. The online course is conducted in Finnish at the request of the commissioner.

The implementation of the project, which is the pilot version of the course, will be at the beginning of the 2023. The author of the thesis will implement the online course for the students. After the pilot version, on the controlling phase, the author will collect the feedback from the course for future development.

TABLE 2. The stages and timetable of project

9 The Implementation of the Project

9.1 Theoretical Framework

Theoretical framework of the thesis has written to respond to the aim of the project. The main aim is to raise the awareness of coaches in disordered eating and eating disorders in the field of sport. Coaches should be able to recognize the signs and symptoms of different eating disorders and be able to approach the athletes with a confident. In daily level, they should be able to prevent the eating disorders and disordered eating by their actions and with relevant knowledge. Theoretical part has divided into five parts; disordered eating, eating disorders, eating disorders in sports, role and responsibilities of coach and online pedagogy. Each section has written by using reliable sources found from different information retrieval portals. All sources of information have been critically examined.

The first two sections have focused on the basic knowledge of disordered eating including RED-S and the most common eating disorders. The signs and symptoms have been described. The descriptions do not get deeper because basic knowledge of the disease and the symptoms is sufficient for coaches. Understanding the difference of disordered eating and eating disorders an how the disordered eating without early identification can lead to eating disorders is a crucial thing for coaches to understand, as well as the prevalence of the energy deficiency in athletes.

The section of disordered eating and eating disorders in sports has focused on describing the sport related predisposing factors, as well as the identification, recovery and prevention face with disordered eating and eating disorders. The data has been described in general level with an emphasis on sport. The treatment process is presented in a general level just to get the basic knowledge how the process progresses. The subject has limited, in a sense of coaches role being more in prevention, support and encouragement of treatment. The section of coaches role and responsibilities has focused more on explaining how the coaches can identify, approach, prevent and be a part of treatment process. The intention has been to bring concrete tools and ideas for coaches. Coach – athlete relationship has been highlighted, because its functionally is really important in different faces of identification, approaching, preventing and treatment.

The last section introduces of online pedagogy, due to final product. The chapter of online pedagogy has not only a theoretical aspect, but also a support for the author in terms of crating the online course based on theoretical part described above.

9.2 Online Course

The commission of the thesis has been the online course of disordered eating and eating disorders in sports for Haaga-Helia. The final product based on the theoretical part of the thesis is held at the beginning of the year 2023, precisely on 16.1.2023-17.3.2023. The first version of the course has developed as a pilot version. All the course materials has written in Finnish, except some of the videos shown in English. Objectives of the course, same as the aim of the project explained in chapter 7, have been added to the course material, as well as the beginning of the each lecture.

The course follows the content of theoretical part with three lectures named by the sections of the theoretical part; 1. disordered eating and eating disorders, 2. disordered eating and eating disorders in sports and 3. role and responsibilities of coach. All the lectures has written in Power Point. Lectures have been enlivened with copyright pictures of the topic. All the videos related to topic have found from YleAreena or Youtube. The assignments of the course have designed to respond to the aim of the whole project described above. Moodle has chosen to course management system software, because of the usage of Haaga-Helia. All the instructions has designed in the way, that students can be able to complete the course independent. The course is asynchronous, so all the lectures and task have completed on Internet without face to face online lessons or meetings with teacher. The students have an opportunity to contact the teacher during the course. Course under the elective studies, is graded by the teacher. Evaluation criteria has shown for students in course materials (appendix 1).

10 The Description and Results of the Project

The final result of this project is the online course of disordered eating and eating disorders in sports. The course cannot be added to appendices, because it may become chargeable in the future. In this reason, it cannot be available on Internet. The description (appendix 1) and the structure of the course will be introduced below (table 3). The first version of the course is a pilot version, held on 16.1.2023-17.3.2023 for Vierumäki campus students elective studies.

TABLE 3. Course Structure

Online course: Disordered Eating and Eating Disorders in Sports
Objectives of the course + evaluation criteria
Part 1:
Lecture 1: Disordered Eating and Eating Disorders
Task 1: Questionnaire on the topics on the lecture
Part 2:
Lecture 2: Disordered Eating and Eating Disorders in Sports Lecture 3: Role and Responsibilities of Coach
Task 2: Book task (Read the book given and answer for the following questions: 1. What new did I learn? 2. How can I utilize it on my own thinking and behaving)
Final Assignment:
Create a prevention program and early identification model to your work environment for disordered eating and eating disorders. Prevention program should involve the instructions and actions made to prevent disordered eating and eating disorders on athletes. In addition, the early identification model should involve the checklist of signs and symptoms and instructions on how to approach the athlete with signs and symptoms of disordered eating or eating disorder.

All three lectures have been designed by using the theoretical framework of thesis. The structure of each lectures is the same as in theoretical framework of thesis with copyright pictures and videos added.

TABLE 4. Disordered Eating and Eating Disorders Lecture Content

Lecture 1: Disordered Eating and Eating Disorders

Objectives of the lecture at the beginning of the Power Point

Disordered Eating:

- Term opened and showed in spectrum between normal eating habits and eating disorders + explained how it can occur and what factors may expose
- RED-S opened and effects on athletic performance and health have shown

Eating Disorders:

- Term explained in general ,as well as incidence, preposing and exposing factors and treatment
- **Anorexia Nervosa, Bulimia Nervosa and BED**
    1. Reading assignment
    2. Diagnostical criteria
    3. General information
    4. Symptoms
- Other Specified Feeding or Eating Disorders; in general
  + Orthorexia Nervosa in general

Video of a patient with an eating disorder

References

10.1 Further Development

At the controlling face, from all the students involved to pilot course will be asked feedback by using Haaga-Helias course feedback form. Online course can be further developed according the feedback for the need of students. The profitability and popularity of the pilot course will be evaluated after the course, and if the pilot course has been successful, it could be continued. In addition, the course could be offered to all students in Haaga-Helia for their elective studies,

including open university of applied sciences. The course will become chargeable, if it will be offered in open university of applied sciences. In the future, Haaga-Helia could work together with other universities of applied sciences and offer the course for all the students interested. Lectures and the knowledge of the theoretical part could be used by lecturing. In fact, the author has reserved already a couple of requests for the further lecturing in big sport events

11 Discussion

The whole thesis including theoretical framework and the online course materials of the thesis has written to respond to the aim of the project. As written in chapter of RED-S, studies have shown that up to 25-50% of male or female athletes suffer from energy deficient. Long term energy deficient have crucial effects to athletes health and performance. Taking this into account, it is really important to educate the coaches and athletes of energy balance as well as disordered eating and eating disorders. The education and early approach to energy deficient are the best ways to prevent disordered eating or eating disorders to develop. Theoretical framework presents the numbers of athletes eating disorders in different sport categories. As present, the numbers in weight category, endurance and aesthetic sports are pretty high. Training intensity and load, as well as dieting and being under review of body composition predispose athletes to eating disorders. By the reason of that, coaches should have at least the basic knowledge how to coach and support athletes on their sports with predisposing factors. Coach- athlete relationship and coaches' own attitudes plays a big role, when approaching the disordered eating and eating disorders. Eating disorders should be made more visible in the field of sport and coaches should reserve more education, in order to address to the development of the disease.

Reliability of the thesis cannot be measured. It mostly based on the resourced used in theoretical framework. Of course, the knowledge and experience of eating disorders of the author have effected to the selection of the content and resources. Online course includes even more knowledge of the topic, because of videos added to it. Course is designed by the author and it is visually considered. Online courses are more common nowadays. As mentioned in theoretical framework of online courses, good online course include some sort of intake through reading, listening or viewing. The course developed, includes reading assignment and videos, as well as some podcast on the refence list of the course materials. In comparison, the course is educationally diverse.

In scenario of making something differently, one approach to this thesis could have been the interviews with the coaches. Coaches could have been asked about their previous knowledge and attitudes towards the disordered eating and eating disorders. The course could have been designed to meet the specific needs of the coaches instead of general overview. In that case, the sampling should have been wide, in order for results to have provided a comprehensive selection of new knowledge to all coaches participating to course.

Overall, the pilot course designed as a final product includes a wide selection of general knowledge of disordered eating and eating disorders. Internalizing all the information provided by the course, the coaches have more knowledge of disordered eating and eating disorders than

individuals in general working in the field of sport. The final assignment of the course is developed to transfer into working life. At the end, the responsibility of utilizing the information learned during the course is coaches. In any case, every contact, information transferred and lectured given makes disordered eating and eating deriders more visible and might prevent future cases, which is the most important outcome of all.

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Appendices

Appendix 1. Course Description

Disordered Eating and Eating Disorders in Sports – Elective Online Course, 5 credits

Learning Objectives:

- The student recognizes the symptoms of disordered eating and various eating disorders

- The student understands the sport related preposing factors for eating disorders

- The student understands the importance of prevention and early identification

- The student is able to prevent eating disorders on her/his working environment and knows how to approach the athlete with possible signs and symptoms in an appropriate way

Content:

The course consists of three lectures, which are:

1. Disordered eating and Eating Disorders

2. Eating Disorders In Sports

3. The role and responsibilities of the coach / instructor in athlete's eating disorders

Course assignments:

1. Questionnaire based on a virtual lecture

2. Book assignment

3. Written assignment

The course is implemented as an online study in the Moodle learning environment. There are no optional performance methods in this course.

Learning materials:

E-Book: Heimo, S & Sailola, T. 2014. Tasapainoa! Syömishäiriöiden ennaltaehkäisy. Lounais-Suomen – SYLI ry. http://www.tasapainoa.fi/images/tasapainoa-kirja/tasapainoa_kirja.pdf

Other learning materials are included in the implementation as links to written materials and videos.

Entry level and connections to other courses:

No previous studies.

Evaluation criteria:

Evaluation criteria - grade 1

- The student passes the questioner related to the virtual lecture on the second attempt

- The book assignment is at passable level. It is clear from the written output that the book has not been read and the questions have been answered narrowly.

- The final written task is at passable level. The output of the task is incomplete.

Evaluation criteria - grade 3

-The student passes the battery of questions related to the virtual lecture on the first attempt

- The book assignment is on advisable level. It is clear from the written output that the student has read the book and answered the questions with thought.

- The final written task is in a good standard. The output presents the symptoms, prevention methods and instructions, as well as instructions how to approach the athlete with symptoms.

Evaluation criteria - grade 5

-The student passes the battery of questions related to the virtual lecture on the first attempt

- The book assignment is on commendable level. It is clear from the written output that the student has read the book and answered the questions with a speculative approach.

- The final written task is a commendable level. The output presents the symptoms, prevention methods and instructions, as well as instructions on how to approach the athlete with symptoms. The output contains concrete instructions and examples that show that they are designed for use by the work community. The output is visually considered.

Appendix 2. Course Structure

Online course: Disordered Eating and Eating Disorders in Sports

Objectives of the course + evaluation criteria

Part 1:

Lecture 1: Disordered Eating and Eating Disorders

Task 1: Questionnaire on the topics on the lecture

Part 2:

Lecture 2: Disordered Eating and Eating Disorders in Sports
Lecture 3: Role and Responsibilities of Coach

Task 2: Book task (Read the book given and answer for the following questions: 1. What new did I learn? 2. How can I utilize it on my own thinking and behaving)

Final Assignment:

Create a prevention program and early identification model to your work environment for disordered eating and eating disorders. Prevention program should involve the instructions and actions made to prevent disordered eating and eating disorders on athletes. In addition, the early identification model should involve the checklist of signs and symptoms and instructions on how to approach the athlete with signs and symptoms of disordered eating or eating disorder.

Appendix 3. Disordered Eating and Eating Disorders Lecture Content

Lecture 1: Disordered Eating and Eating Disorders

Objectives of the lecture at the beginning of the Power Point

Disordered Eating:

- Term opened and showed in spectrum between normal eating habits and eating disorders + explained how it can occur and what factors may expose
- RED-S opened and effects on athletic performance and health have shown

Eating Disorders:

- Term explained in general ,as well as incidence, preposing and exposing factors and treatment
- **Anorexia Nervosa, Bulimia Nervosa and BED**
    1. Reading assignment
    2. Diagnostical criteria
    3. General information
    4. Symptoms
- Other Specified Feeding or Eating Disorders; in general
  + Orthorexia Nervosa in general

Video of a patient with an eating disorder

References