Introduction

Physical activity might be an effective measure for the treatment and even for the prevention of psychiatric diseases such as depressive and anxiety disorders. In addition, physical activity has increasingly been recommended to individuals with or without disease in order to improve their quality of life. On the other hand, physical activity can compromise mental health; especially when performed in a more intense manner ***(Pate et al; 1995).***

It is perhaps a common perception that athletes are automatically healthier and more attentive to their overall well being. But researchers found that athletes appear to be at a higher risk for certain lifestyle behaviors. The added emotional, physical, and mental stress from athletics may result in certain maladaptive behaviors in athletes. One of these behaviors is the eating behavior **(Baer et al; 1995).**

Ever-increasing participation of women in competitive sport has created a requirement for more gender-specific sport medicine knowledge. For some individuals; physical activity becomes an obsession; resulting in an exaggerated preoccupation with exercise and excessive training even in the presence of medical counter indications; which can interfere with personal and occupational relationship. Any female athletes is at risk for the female athlete triad which

consists of eating disorder, osteoporosis and amenorrhea; but women who participate in endurance and performance sports where an athlete is judged on appearance or where low body fat is an advantage; are at higher risk for extreme weight-control behavior ***(Bamber et al; 2000).***

Eating disorders in athletes have become an area of concern in recent years. While more prevalent in female athletes and female sports, eating disorders have long-term and permanent adverse health effects. At some point in their career, almost all female athletes are concerned about their body weight. However, weight loss and weight gain can be a very crucial and beneficial part of an athletic training program. When athletes lose weight too rapidly or attempt to maintain a weight loss below the desirable level, it becomes a concern. Losing weight rapidly or maintaining very low body weight may affect both weight regulation and athletic performance **(Baer et al; 1995).**

As the conditions related to the triad were interrelated, and thus, athletes who were at risk in any of the three conditions should be screened for the other two components .Eating disorders, however, were found to be more prevalent among those athletes with higher aims and expectations. Researchers suggest that those in the leanness sports were at higher risk of developing eating disorders. Besides the characteristic of the sports which places a higher emphasis on

a lean body, the highest mean dissatisfaction among athletes may be due to physical changes related to puberty. Changes in body shape due to puberty affect not only physical appearance but also an athlete's performance **(Nattiv et al; 2007).**

Scott et al; (2003), sought to investigate the relationship between a number of areas of elite student-athletes' lives and disordered eating, through surveying 1445 elite Division I athletes at 11 different institutions and in 11 different sports. Results demonstrate that the variables entered into each model predicted between 40.5% and 46.4% of the variance for the restriction of food, body dissatisfaction, and drive for thinness. Of the 11 sports included in the analysis, wrestling and gymnastics demonstrated elevated levels of drive for thinness, food restriction, and purging behavior compared to other athletes.

Rationale

Female athletes appear to be at a higher risk for certain lifestyle behaviors. The added emotional, physical, and mental stress from athletics may result in certain maladaptive behaviors in athletes. One of these behaviors is the eating behavior.

Hypothesis

Understanding mental health issues in the athlete population is important. Athletes are involved in supervised and organized institutes; therefore, there is an opportunity for developing and implementing effective prevention and treatment interventions in this population, for improving their performance.

To explore the psychiatrist's role in sport medicine and identify the comorbidities of eating disorders in female athletes.

Aim of the work

1- To determine the prevalence of eating disorders among female athletes.

2- To identify relationship between the type of sport and eating disorders

3- Increasing awareness of eating disorders and female athlete's triad (Eating disorder, amenorrhea & osteoporosis) among athletes, parents, and coaches which will affect the plan of management.

Chapter 1
Eating Disorder in relation to Sport Psychiatry

The perception of being overweight appears to have a pervasive influence on young women where individuals frequently perceive their weight status incorrectly (e.g., thinking they are overweight when normal weight). Incorrect weight perceptions are more common in young women, with persistent overestimation of weight and attempts at weight loss even when unnecessary **(Haase; 2010).**

Weight perception features prominently in dieting and eating behaviors, where normal weight adolescents and young adults with overweight perceptions have poorer eating behaviors and are more likely to be trying to lose weight. Although body dissatisfaction has been identified as a strong predictor of dieting and disordered eating ,common antecedents (e.g., perfectionism, low self-esteem) and moderating variables (e.g., neuroticism, physique anxiety) have also been proposed as key factors contributing to disordered eating with potential implications for associations with overweight perceptions **(Haase; 2010)**.

Eating disorder (ED) is marked by extremes. It is present when a person experiences severe disturbances in eating behavior, such as extreme reduction of food intake or

extreme overeating, or feelings of extreme distress or concern about body weight or shape. A person with an eating disorder may have started out just eating smaller or larger amounts of food than usual, but at some point, the urge to eat less or more spirals out of control **(Birmingham et al; 2005).**

The two main types of eating disorders are anorexia nervosa and bulimia nervosa. A third category is eating disorders not otherwise specified (EDNOS), which includes several variations of eating disorders. Most of these disorders are similar to anorexia or bulimia but with slightly different characteristics. Binge eating disorder, which has received increasing research and media attention in recent years, is one type of EDNOS. Eating disorders frequently appear during adolescence or young adulthood, but some reports indicate that they can develop during childhood or later in adulthood. Women and girls are much more likely than males to develop an eating disorder **(Birmingham et al; 2005).**

Types of Eating Disorders

Anorexia Nervosa (AN)

Anorexia nervosa is an eating disorder that tends to begin during adolescence in women and is characterized by relentless pursuit to lose weight, mostly by self-starvation, and distorted body image, as well as high mortality rates.

Nonetheless, a large number of AN patients benefit from treatments offered in specialized eating disorder centers **(Zipfel et al; 2013)**.

Besides food restriction, physical hyperactivity is another frequent puzzling symptom in AN patients that is poorly understood, but plays a central role in the pathogenesis and progression of the disorder. AN patients with hyperactivity show poorer recovery rates, higher rates of relapse, longer periods of hospitalization and increased energy requirements **(Hebebrand and Bulik; 2011).**

Until today, the etiology of AN is still largely unknown and mechanisms that maintain the disorder remain poorly understood **(Kaye et al; 2013)**.

Bulimia nervosa (BN)

Bulimia Nervosa (BN) is defined by eating behaviors that include episodes of binge eating which are followed by recurrent inappropriate behaviors (such as self-induced vomiting) performed in an attempt to avoid weight gain from the caloric overload. The behavior must be frequent (on average, at least two times per week for 3 months or longer **(Martica et al; 2013).**

Binge Eating Disorder (BED)

Binge Eating Disorder (BED) is currently characterized by recurrent episodes of binge eating occurring at least twice a week for 6 months or longer. In contrast to Bulimia Nervosa, there are no inappropriate compensatory behaviors performed to counteract the potential weight-gaining effects of bingeing **(Martica et al; 2013).**

Eating disorder NOS:

A third category is eating disorders not otherwise specified (EDNOS), which includes several variations of eating disorders. Most of these disorders are similar to anorexia or bulimia but with slightly different characteristics, it includes:

Anorexia Athletica:

Anorexia Athletica is characterized by excessive and obsessive exercise, and is common in people who participate in sports where a lean, light body is considered advantageous. This if often accompanied by calorie restriction, which can result in malnutrition **(Newell; 2010)**.

Anorexia Athletica may be a subclinical eating disorder, it can still lead to medical and mental health complications AA must involve weight loss, gastrointestinal

complaints, the absence of medical or affective disorder explaining the weight loss, excessive fear of becoming obese, and restriction of caloric intake. One of the following symptoms must also be present: delayed puberty, menstrual dysfunction, disturbance in body image, use of purging methods, binge eating, or compulsive exercising. In this special population, the criteria should be validated for AA (**Currie and Morse; 2005).**

Special Considerations in Female Athletes

As female athletic participation has increased, the positive effects of exercise on health have become evident. However, with this growth in sports activity a set of health problems unique to the female athletes has emerged. The escalation in female sports participation has been increased over 900% and intercollegiate sports participation witnessed a growth of 450% **(Javed et al; 2009)**.

Female athletes are exposed to similar societal pressures and likely experience similar body size and weight distortions as non-athletic females, as well as potentially being at higher risk of disordered eating. Given the pressure to perform and achieve success in sport, female athletes may resort to disordered eating to compensate for these pressures, potentially compounded by distorted weight perceptions. Although prevalence and risk of disordered eating in female

athletes varies across sport classification, specific personality characteristics of clinical patients have been consistently identified as similar antecedents of disordered eating in female athletes, namely perfectionism and social physique anxiety (SPA) **(Mack et al; 2007).**

For instance, in women perceiving themselves as overweight, perfectionism was found to be a risk factor for bulimic symptoms , suggesting weight perception to play an important role between antecedents and eating behaviors in female populations **(Egan et al; 2010).**

Prevalence of eating disorders among female athletes

Eating disorders in athletes have become an area of concern in recent years. While more prevalent in female athletes and female sports, eating disorders have long-term and permanent adverse health effects. At some point in their career, almost all female athletes are concerned about their body weight. However, weight loss and weight gain can be a very crucial and beneficial part of an athletic training program. When athletes lose weight too rapidly or attempt to maintain a weight loss below the desirable level, it becomes a concern. Losing weight rapidly or maintaining very low body weight may affect both weight regulation and athletic performance **(Baer et al; 1995).**

In pursuit of excellence, athletes take risks. Many of these risks are calculated and well-managed, but they are risks nonetheless. Athletes risk traumatic and overuse injuries and make personal sacrifices in their education, career, and personal relationships. The well-prepared athlete and his or her support team take steps to minimize these risks in pursuit of a goal **(Currie& Morse; 2005)**.

Since the 1980s it has been apparent that the possibility of developing an eating disorder is to be added to the list of risks to be addressed and managed. Having an eating disorder is associated with considerable morbidity and significant mortality. Athletes who have eating disorders tend to have shorter careers characterized by inconsistency and recurrent injury **(Birch; 2005)**

Studies have shown that in certain sports, adolescent athletes have an increased risk of developing eating disorder pathology compared to adolescents from the general population. Moreover, ED pathology seems to be more prevalent in (a) athletes compared to non-athletes, particularly in high sport level athletes, (b) female compared to male athletes and (c) leanness- and weight-dependent sports compared to other sports **(Durme et al; 2012)**.

Studies that focused on aesthetic athletes indicate that female figure skaters and ballet dancers show more eating

pathology compared to female adolescents from the general population: higher drive for thinness, more features of bulimia, more dieting behaviour and more concerns about their weight and body shape. In male aesthetic athletes, no differences were found with the male norm group **(Sundgot-Borgen and Torstveit; 2004)**

Eating disorders (ED) are behavioral syndromes that are associated with considerable morbidity and therefore one of the highest mortality rates among mental illnesses It is estimated that 95% of ED cases occur among women, and These 95% of cases occur in people under the age of 25.The benefits of sports practice are undeniable, including increases in self-esteem that may serve as a protection against ED by development of reducing feelings of body dissatisfaction .Conversely, the relationships of the athletes to the media, their idols in the sport, their coaches and their friends may all be risk factors (**Coelho et al; 2013).**

The pathways to the development of ED may be different for athletes than for non-athletes. For example, the demands of a sport to meet a particular body requirement, even in the absence of a high level of body dissatisfaction, may be sufficient for the development of ED (**Coelho et al; 2013).**

For athletes, ED behavior may reflect their dedication to the sports therefore, athletes try to achieve the ideal body shape" for their sport to ensure optimum performance. This ideal body shape" is generally mirrored in successful adult athletes in the sport. This can be a significant problem, especially for adolescent female athletes, who are experiencing puberty and thus may gain a significant amount of fat **(Thein-Nissenbaum et al; 2011)**

Moreover, when the sport requires the exposure of a female's body and emphasizes flexibility and agility of movement, as is the case in tennis, it may present a risk for ED onset. Also, researches using eating behavior questionnaire administrated tennis players and found that 24% of them used some type of pathogenic weight control method **(Martinsen et al; 2010)**

Costa 2013, found that 44.9% of Brazilian female adolescent swimmers, had positive results on at least one of abnormal weight control behaviors.

Lanser et al; 2011showed that 5% and 8% of tennis players exhibited bulimic symptoms or abnormal eating behaviors, respectively**.**

In contrast, Other studies show that athletes are no more at risk for the development of eating disorders than

non-athletes **(Carter, 2002; Davis & Strachen, 2001; Reinking & Alexander, 2005).**

Furthermore, other researchers found the prevalence rate of disordered eating behaviors as 16.7% in female athletes and demonstrated that female athletes who have disordered eating behaviors had higher state and trait anxiety levels than the athletes who do not have disordered eating behaviors **(Vardar et al; 2007).**

From the general point of view, the occurrence of disordered eating behaviors has been reported in 15% to 62% of female athletes **(Sundgot-Borgen & Torstveit; 2004).**

Coelho et al 2010 reported that 12 studies found no significant difference between the athlete group and control group regarding the presence of disordered eating ($p > 0.05$), while 6 studies reported a higher prevalence of disordered eating in the athlete group than in the control group.

Moreover, among athletes it has been reported that some look at ED behavior as a natural part of their sport and are not necessarily generally dissatisfied with their body shape or weight, do not realize that they have a problem, and thus do not report ED problems. In addition, it has been argued that the ED behavior may reflect a rational response to pressure to achieve a body shape that will ensure optimal performance and reflect dedication to their sports rather than