



The Study of Eating Disorders and Body Image Among Elite Martial Arts Athletes

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ABSTRACT

Study objective: The competitive sports environment can enhance social and cultural pressure towards having ideal body weight in weight-sensitive sports. The close relationship between body image and performance makes the elite athletes vulnerable to eating disorders. Thus, the purpose of this research was to study eating disorders and body image among weight-class elite athletes. **Methods:** A cross-sectional study was carried out with elite martial arts athletes (Karate, Taekwondo, and Judo) who were considered to be of higher risk for eating disorders. 63 elite martial arts male athletes (18.59 ± 5.29 yrs), and 63 non-athlete persons (17.3 ± 3.4 yrs) were recruited. Body Mass Index (BMI), Waist Hip Ratio (WHR), and Percent Body Fat (PBF) were measured using caliper and meter. Eating Disorder Diagnosis Scale (EDDS) and Body Image Rating Scale (BIRS) were used to study eating disorders and body image among elite martial arts athletes. **Results:** no sign of clinical EDDS were found among the investigated athletes, and non-athletes. There were significant differences in total score of EDDS ($p=0.001$), eating disorder and weight concern subscales (respectively $p=0.012$, $p=0.001$) in athletes and non-athletes. Furthermore, compared with the non-athlete group, elite athlete group with middle, good, and great body images scored higher on total score and all subscales of EDDS ($p \leq 0.05$). **Conclusion:** The results from our study show the presence of worry about eating disorder especially body weight and eating concern in elite athletes and the early detection of it may prevent progression to severe eating disorders.

Keywords: Eating disorders, Body image, Martial arts

INTRODUCTION

Today's young people are very sensitive about their body image perception and any disturbances in their perceived image make them anxious by which their eating patterns and dietary choices may be changed which may result in eating disorders such as vomiting or anorexia nervosa. There are some evidences suggesting that body ideal has been changing through different population ages, different groups especially in elite athletes [1]. Of all factors affecting the body image, attractiveness is of importance for youth in sporting context. In other words, athletes are more satisfied with their look and body image when compared to other peers. An important concept which influenced by body image and affects negatively the athletic performance is eating disorders which characterized by severe disturbances in eating behavior as well as in body image.

Achieving and maintaining the optimal body satisfaction for a specific sport involves having a control over the eating behavior. The necessity of optimal body composition in elite athletes imposes a lean body, without considering health-related aspects. Such distorted standard makes an increasing number of athletes to go on weight-control diets, to over-practice physical exercises, and to a wide use of laxatives, diuretics and anorectic drugs which consequently lead to eating disorder due to body shape dissatisfaction. High prevalence of eating disorders in competitive sports have been reports especially those which require a low body weight or low percentage of body fat. More precisely, those in which weight classes are involved, such as martial arts in which leanness is thought to be effective in optimal performance. In this regard, today, the increased prevalence of eating disorders among the competitive athletes has made series concerns for coaches [2,3].

A meta-analysis of 34 studies on eating problems in female athletes confirmed that, in athletes, a high drive for thinness was not accompanied by high body dissatisfaction. In contrast, De Bruin, et al. found that female gymnasts' dieting behaviors were only moderately related to some aspects of body image, while stronger relationships were found with sport-specific variables such as weight-related coach pressure [4]. Body image disturbances seem to contribute to patterns of eating problems in athletes, leading to the claim that a disturbed body image is an absolute criterion of eating disorders in athletes just as it is in non-athletes [1]. These are considered precursory behaviors of eating disorders which include anorexia and bulimia nervosa. Eating disorders are from multiple causes, including genetic, environmental, and behavioral factors [5]. People with eating disorders have, frequently an excessive concern with weight and diet, and as a result, are dissatisfied with how they look and have a distorted perception of their body image, and their athletic performance may be influenced by negative effects of eating disorder. Moreover, it was suggested that eating problems in athletes may differ from those in non-athletes [6]. Conclusively, the purpose of this study was to investigate eating disorders and body image among elite martial arts athletes.

METHOD

The elite athletes in Karate, Taekwondo, and Judo (With the background of championship in international events and tournaments in the previous two years) attending sport complex were recruited (n=63) in Iran, Qazvin and a control group of 60 non-athletes were recruited following screening criteria the same as elite athletes group. For inclusive criteria of groups, the participants were asked to complete the self-reported questionnaires including a battery of assessment questions regarding training and championship background, nutritional status, and dieting and weight fluctuation history, use of pathogenic weight control methods. Their BMI (20-25 kg/m²) and age groups (15-25 yrs) were also considered. Body weight and height were measured respectively to the nearest 0.1 kg and 0.1 cm with subjects lightly dressed and without shoes. BMI was calculated as weight (kg) divided by height square (m²). Skinfold thickness was measured using skinfold caliper by the same investigator at the following sites: triceps, subscapular, supraliac. All measurements were taken three times at each site, and mean of the three values was used.

EDDS consists of 22 elements, which are answered on a 6-point scale. Subjects must indicate whether each situation happens to them never, not very often, sometimes, often, almost always, or always. The scale has shown interrater agreement, internal consistency, and discriminant validity [7,8]. Body Image Rating Scale (BIRS) validated by Cooper consists of 33 questions which are answered on a 5-point scale and was used [9].

Statistical analysis

The statistical analyses were carried out using SPSS software. The results are expressed as mean values with Standard deviation. Eating Disorder Diagnostic Scale (EDDS) and Body Image Rating Scale (BIRS) were applied to evaluate the Eating disorder and body image respectively.

RESULTS

Demographic statistics of the screening criteria are shown in Table 1. The mean weight, BMI of the athletes, was higher than of non-athletes, but this was not statistically significant (Table 1).

Table 1 Demographic characteristics of the participants

Variables	Elite Athletes (n=63)	Non-athlete (n=60)
Age (yrs)	18.59 ± 5.29	17.3 ± 3.4
Height (cm)	175.30 ± 11.15	172.30 ± 6.1
Weight (kg)	67.1 ± 13.2	66.1 ± 4.2
Exercise duration (Hours a week)	4.66 ± 0.76	0.4 ± 0.1***
BMI (kg/m ²)	21.65 ± 2.73	22.4 ± 1.8
PBF (%)	21.1 ± 1.4	27.4 ± 1.4**

p<0.01; *p<0.001; PBF: Percent Body Fat; BMI: Body Mass Index

As it can be seen in Table 2, considering cut-off of 21 points (point 16.5), no sign of clinical EDDS among the investigated athletes, and non-athletes.

Table 2 Comparison of EDDS in athletes and non-athletes

EDE items	Athletes	Non-athletes	t	P-value
Eating concern	8.55 ± 4.14	6.81 ± 3.29	2.54	0.012*
Weight concern	6.33 ± 0.47	4.23 ± .32	3.65	0.001**
Shape concern	4.55 ± 2.59	3.98 ± 2.28	1.31	0.19
Total	2.23 ± 2.69	0.90 ± 1.34	3.509	0.001**

*p<0.05; **p<0.01

Our investigation revealed also a significant difference between athletes and non-athletes in total score of EDDS (p=0.001), furthermore, two of subscales including eating disorder and weight concern were also significant with an excellence for non-athletes (respectively p=0.012, p=0.001).

Table 3 Comparison of EDDS in different levels of body image in athletes and non-athletes

Body image scales	Elite Athletes EDDS	Frequency	Non-Athletes EDDS	Frequency	t	p-value
1	0	0	0	0	-	-
2	2.00 ± 2.26	27 (42%)	0.88 ± 1.4***	20 (33%)	3.32	0.001**
3	2.55 ± 2.82	29 (46%)	0.96 ± 1.3***	26 (43%)	4.04	0.0002***
4	1.85 ± 2.60	7 (11%)	0.71 ± 0.9***	14 (23%)	3.28	0.001**
Total	2.23 ± 2.69	63	0.90 ± 1.3***	60	3.51	0.0006***

0-50="1=Weak"; 51-75="2=Middle"; 76-100="3=Good"; 101-110="4=Great"; **p<0.01; ***p<0.001

As shown in Table 3, compared with the non-athlete group, elite athlete group with middle, good, and great body images scored higher on total score and all subscales of EDDS (p ≤ 0.05) (Figure 1).

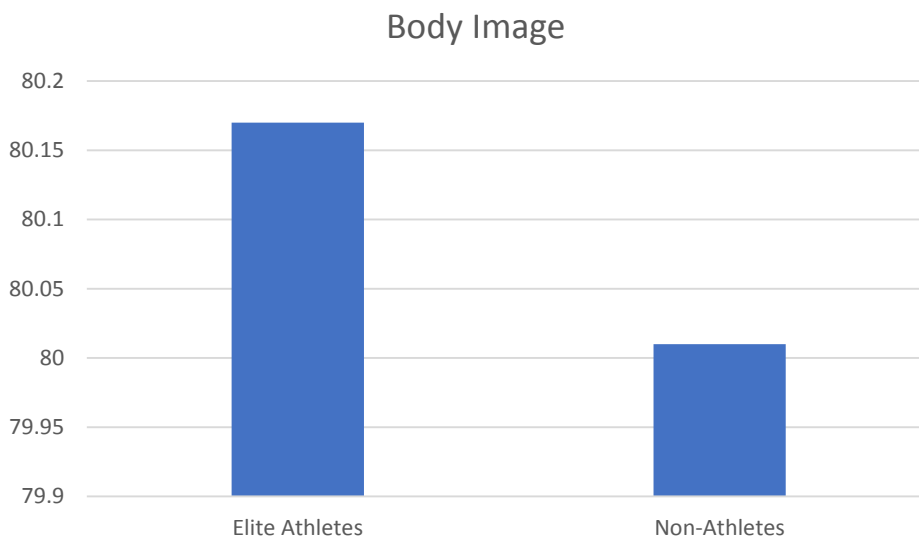


Figure 1 The difference between body image of elite athletes and non-athletes

DISCUSSION

According to the literature, the prevalence of the eating disorder due to body dissatisfaction is found significantly among elite athletes; particularly those whose sports modalities require low body mass (weight sensitive sports such as martial arts). This problem rises the necessity of body image and body satisfaction research among elite athletes. On the other hand, having an optimal body image is of interest for common people due to huge media advertisement. This study is the first to publish prevalence data of EDDS for the male elite athletes in Iran.

Data analysis referring the total score and subscales of EDDS demonstrated that there was a significant difference between athletes and non-athletes in total score of EDDS; furthermore, two of subscales including eating disorder and weight concern were also significant with an excellence for non-athletes. It was also found that there was a significant difference for EDDS in different levels of body images in a way that elite athlete group with middle, good, and great

body images scored significantly higher in total score and two subscales of EDDS (Eating concern, Weight concern) than non-athlete group. Interestingly, it was found that Shape concern was not significantly different in two groups. One possible reason may be related to this issue that probably, the common people emphasizes mostly on BMI as a health index, besides, elite athletes also give serious attention to their standard competition weight. In this regard, both groups had no significant difference in their BMI while the PBF was significantly different. Obviously, the extra fat mass in non-athletes are replaced with muscle mass and that's why their weight concern didn't differ in the study. It must be noted that there was no sign of anorexia or bulimia nervosa among the investigated athletes, and non-athletes. On the other hand, the level of EDDS is higher among elite athletes than control. This is consistent with the study by Oliveira which reported the presence of symptoms that do not actually characterize bulimia or anorexia nervosa, but they point to the need of a careful surveillance and assessment of eating disorders and their precursors among athletes, as a way of prevention [10].

CONCLUSION

The results from our study show the presence of worry about eating disorder especially body weight and eating concern in elite athletes. Such behaviors are called partial eating disorder syndromes, and when associated to systematic and exhaustible physical exercises, they become risk factors, and their early detection may prevent progression to severe eating disorders. Because other researchers have used different instruments (for screening the EDDS), small samples, athletes with different performance levels, it's difficult to compare the study results with the previous ones. The second aim of our study was to provide new evidence concerning the comparison of body image in elite athlete and non-athletes and no significant difference was reported in the groups. It is important to note the limitations of these studies when interpreting the findings. The evidence in support of the results should be interpreted with caution because of the low numbers of participants.

Therefore, these findings may not generalize to all elite martial arts athletes. Thus, epidemiological studies should be carried out, considering the different sports modalities, training levels, and more variables kinds of martial arts among Iranian athletes. Besides, more research is needed with the purpose of understanding complex biological, psychological, epidemiological, anthropological, sociological, economic, and historical aspects; thus, requiring an interdisciplinary focus to integrate these different dimensions seems to be required in future studies.

DECLARATIONS

Acknowledgment

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Conflict of Interests

The authors and planners have disclosed no potential conflicts of interest, financial or otherwise.

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