Rapid weight loss in female judokas during the pre-competitive period and the risk of eating disorders

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ABSTRACT

The aim of this research is to study rapid weight loss behaviours in the precompetitive period and their repercussions on the onset of eating disorders in high-level Algerian female judo between 15 and 20 years of age. The study was done on thirty one athletes, with a rapid weight loss assessment using the rapid weight loss questionnaire and an eating disorder assessment using the questionnaire for the assessment of the female athlete screening tool, the results revealed rapid weight loss scores of 35.03 ± 11.20, with a prevalence of developing an eating disorder at 74.2% and the presence of a positive correlation between rapid weight loss and the appearance of eating disorders.

Keywords: rapid weight loss; eating disorders; female judo.

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INTRODUCTION

For some sporting disciplines, weight and body composition are real determinants of performance. Similarly, for so-called weight-category disciplines, such as judo, body weight control is decisive for inclusion in a predetermined category (Xavier Bigard, 2017).

The practice of judo in competition is very demanding in terms of energy because it involves performing high-intensity efforts interspersed with short recovery periods. Despite the importance of energy metabolism in achieving high performance in judo, most competitors adhere to draconian diets in order to compete in the lightest weight category possible in relation to their morphology (Paillard T., 2010). To lose body mass, judokas must impose a negative energy balance on their body (energy expenditure greater than food intake) with water restrictions and diets unsuited to their training load and a significant increase in the hourly volume of physical exercises. All of these manipulations are part of rapid weight loss (RWL) strategies.

The RWL manipulations can sometimes lead to the installation of eating disorders (ED) at the origin of the appearance of several disturbances especially on the hormonal and energetic level. However, the prevalence of ED in the pre-competitive period in female judo athletes has hardly been studied.

Many judokas seek to lose weight quickly in the pre-competitive period to change categories, and increase their chance of success in competition. To do this, they undertake weight loss diets in the pre-competitive period likely to lead to the appearance of ED harmful to their health and performance.

What is the prevalence of ED in the pre-competitive period among high-level Algerian female judokas?

The aim of our study was therefore to evaluate the rapid weight loss in the pre-competitive period and to determine the prevalence of ED in Algerian female judokas practicing judo at a national and international level.

The question asked through this literature review would be to know is there a relationship between RWL in the pre-competitive period and the appearance of ED in female judokas between 15 and 20 years old?

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2. RWL strategies and methods

The majority of athletes practicing judo seek to compete at the lightest weight possible, believing that this will give them a competitive advantage over their opponents. Depending on the level of competition, weight class, age, gender and excess weight, athletes use different active (increased exercise) and passive (example, low calorie diet and sauna). The RWL generally represents between 5 to 10% of the body weight of the athlete during the week preceding the competition (Franchini E, 2012). The basic strategies for RWL are:

a) Reduced food and water intake.

b) Increased body secretions.

C) Increased body metabolic rate to burn fatty tissue.

Athletes use one or more of these methods at the same time. Reducing food and fluid intake is RWL main strategy. Most weight class athlete's start restricting their diet and reducing their fluid intake the week before their weigh-in and gradually increase the restrictions as they get closer to the weigh-in date. On the last day before the weigh-in, many athletes fast and some are so dehydrated that they suck on ice cubes to prevent their mouths from becoming excessively dry (Artioli GG G. B., 2010).

Cessation of restrictive diets after weighing usually results in rapid weight gain due to intensified fat mass accumulation in a mechanism known as post-starvation obesity (Weyer C, 2000). Repeated cycles of RWL and weight regain are associated with long-term overall weight gain (Saarni SE, 2006).

Reducing body weight by increasing body secretions, sweating, and dehydration is another RWL strategy that is typically used a few days before the weigh-in. About 65% of the human body is made up of water, which is actually a good source of significant and temporary RWL in cases of increased sweating and dehydration. This method of weight reduction is so popular among athletes that it is known as "drying" (Morton JP, 2010).

Reduced body water can be easily and quickly recovered by hydrating after weighing. Various methods of severe dehydration including the use of dry or wet saunas, training in heated rooms and training with plastic or rubber suits

in addition to limiting fluid intake are commonly practiced by athletes in the last hours before the weigh-in (Oppliger RA, 2003). The use of laxatives and intentional vomiting are other aggressive methods that are used mainly on the last day before weighing in to minimize body weight (E. Filaire, 2007) Although dangerous and prohibited by the World Anti-Doping Agency, the use of diuretic agents is another method used by RWL in the last hours before the weigh-in (Cadwallader AB, 2010).

Another strategy for RWL is to do some tough exercises a few days before the weigh-in. The general goal of excessive exercise is to reduce body weight by using up body fat and even glycogen resources, as well as increasing dehydration and sweating. Running, jogging, cycling, and swimming are the most commonly used types of exercise. Running or prolonged jogging at aerobic intensity in heated rooms or wearing vapor-proof suits is the most common practice (Alderman B, 2004). Some athletes choose high-intensity intermittent exercise programs to reduce subcutaneous and abdominal body fat (SH, 2011).

3. Eating disorders in female athlete:

ED are psychopathological disorders characterized by abnormal eating, dysfunctional relationships with food, and preoccupation with weight and shape. These disorders are recognized by health professionals as psychiatric disorders of biological origin. ED affects daily functioning and often led to physical complications and psychological distress (Zumwalt, 2014, p. 149).

ED in athletes are probably the best-studied psychiatric disorders in this population. Disorders include anorexia nervosa, bulimia nervosa, binge eating disorder, and other so-called unspecified eating disorders. This latter group may include, for example, athletes who otherwise meet the criteria for anorexia nervosa, but are within the normal weight range. Risk factors for the development of eating disorders in athletes are as follows (Reardon, 2017):

a) Participation in so-called "thin" sports in which there are weight categories such as judo.

b) The female sex.

c) Early start to specific training.

d) Perfectionism and excessive compliance with coaching recommendations.

e) Injuries.

f) Decline in sports performance.

4. Methods and Materials:

In our study we used the correlational descriptive approach. This is the appropriate approach for our study and which makes it possible to demonstrate whether there is a significant relationship between RWL in the pre-competitive period and the onset of ED in female judokas between 15 and 20 years old. This study focused on a sample of 31 female judokas aged 15 to 20, from the cadet category (between 15 to 17 years old 16 athletes 52%) and junior category (18 to 20 years old 15 athletes 48%) of national and international level. To obtain the maximum possible information for our study, we established a questionnaire constructed from 2 validated assessment tools (RWL-Q (rapid weight loss in judo), FAST-Q (assessment of eating disorders in athletes women). to the distribution of the questionnaires fifteen days before the competition.

The anthropometric parameters have been measured thanks to a professional impedancemeter Tanita (SC-240 MA) Precision body composition analyzer which establishes correlations with the stallion measurement Dexa (Dual Energy X-Ray Absorptiometry) with a tolerance of 0.1 kg. The size has been measured with a tolerance of 0.1 cm using a Tanita HR001 tough man (removable portable plastic hob 0 to 207 cm). From these measurements was calculated the classic body mass index (BMI). The anthropometric measurements were carried out fifteen days before the competition, in the morning at 8 a.m. and 30 minutes.

5. Results and discussion:

The mean characteristics of this population were as follows: age (17.33 ± 1.62 years), weight (59.8 ± 11.275 kg), height (160.61 ± 6.12 cm), BMI (23.0 ± 3.56), practicing judo at a national and international level with a training volume that varies between 12 to 14 hours per week. From the results of the RWL-Q questionnaire, the age from which judokas began to participate in

competitions is 11.32 ± 4 years, with a frequency of participation in competitions of 6.87 ± 2.56 and a success rate in competitions of 4.39 ± 1.78. It can be said that the age at which participation in competitions begins is very early. They began to lose weight from an age of 10 to 16 years (13.89 ± 3.04 years) and reported a pre-competitive weight reduction of 4.96 ± 6.81 kg and a cyclical variation of weight (CVW) of 3.12 ± 5.84 per year and engaged in the weight loss process 2 to 15 days (7.35 ± 6.53 days) before competition, the weight recovered within a week after the competition is 2.65 ± 3.10 kg. Our studied sample presents very high RWL scores of 35.03 ± 11.20 sign of a rapid, repetitive and very aggressive weight loss process in the pre-competitive period. Several studies confirm these results, Rafael lima kons (Kons RL, 2017) in a study in Brazilian athletes who practice judo, the majority of athletes reduced 7.1 ± 6.8 kg and began to lose weight for the competition between 13-16 years old and embarked on the weight loss process 10-20 days before the competition, resulting in an average reduction of 7 kg. Franchini et al, show that 60% of judo athletes started to lose weight rapidly very young before competitions (i.e. between 12 to 15 years old), in addition, these athletes are at high risk of problems related to weight loss (Franchini et al, 2012). Artioli et al, (Artioli GG G. B., 2010) Da Silva Santos et al (Da Silva Santos, 2016), Brito et al, (Brito CJ, 2012) revealed that reduction behaviors generally start at age 17, with each process beginning approximately 14 days before the competition resulting in an average weight loss of 8.5 kg. In addition, athletes of different ages reduced from 2 to 11 kg in 5 days, who also reported that karate and taekwondo competitors began to adopt body weight reduction behavior at around 13-14 years of age, although that they have reduced their weight by 2 to 3 kg. In the study by Berkovich et al (Berkovich BE, 2016), RWL was practiced by 80% of athletes before competition, starting at a mean age of 12.5 ± 2.2 years with the highest prevalence (~ 94%) among older group of judoka (16-17 years old). Pre-competition weight loss was 8 ± 5.4 days, with an average weight reduction of 1.5 ± 1.1 kg. The number of CVW per athlete over the past season was 2.8 ± 2.2.

The results of the RWL-Q questionnaire, which also show a significant influence of coaches 52% and parents 40% on the decision of judokas on rapid weight loss practices in the pre-competitive period. Previous studies have also shown that the coach has the greatest influence on weight loss in young judokas (Berkovich BE, 2016). Similar results were observed in wrestlers,

among whom the coach and training partners were the most influential (Oppliger RA S. S., 2003).

From the results we notice in the judokas as a method of weight loss, a tendency towards an increase in exercises (more than usual) 43%, consumption restrictions (skipping 1 or 2 meals 11%, fasting 10% and restricting fluid intake 18%) and excessive sweating (training with rubber/plastic suits 18%) were the most pronounced methods. Several studies (Berkovich BE, 2016; Da Silva Santos, 2016; Kiningham RB, 2001; Kons RL, 2017; Oppliger RA S. S., 2003) have also shown that the methods most frequently used by athletes in weight-class sports were: increased exercise more than usual, food and fluid restriction, intentional training in heated training rooms.

The results of the FAST-Q questionnaire of judokas in the pre-competitive period show a very high prevalence of ED of 74.2% (23 athletes) including subclinical ED of 64.5% (20 athletes) with a FAST-Q score of 85, 25 ± 5.00 and clinical ED of 9.70% (3athletes) with a FAST-Q score of 97.33 ± 2.08. Only 25.8% (8 athletes) of judokas with a FAST-Q score of 73.37 ± 2.53 present an absence of ED. A linear regression was established between the FAST score of the judokas and their RWL score in the pre-competitive period. A scatter plot representation (Fig.1) of the regression shows a correlative relationship with a positive linear line, between the judokas' FAST score and their RWL score in the pre-competitive period. The R2 value (0.301) indicates the proportion of the variability of the dependent variable FAST score explained by the regression model. We can therefore say that judokas' RWL score can explain nearly 30% of the variation in their FAST score. The value of (F) calculated is 12.506, therefore higher than the value of (F) tabulated 2.95 at the level of significance 0.05 and the degree of freedom (29). This means that the probability of obtaining an F value of this size by chance is less than 0.05%, so there is a statistically significant relationship between the dependent variable FAST score and the independent variable RWL score. The value (t) calculated is 3.536, therefore higher than the value of (t) tabulated 2.045 at the level of significance 0.05 and the degree of freedom (29). This means that the independent variable RWL score is a significant explanatory variable in our model. The correlation coefficient calculated for the relationship between FAST score and RWL score is 0.549 is greater than the value of r tabulated

0.3809 at the level of significance 0.05 and the degree of freedom (29).

Fig.1. Scatterplot representation of a simple linear regression between FAST score and RWL score of female judokas.
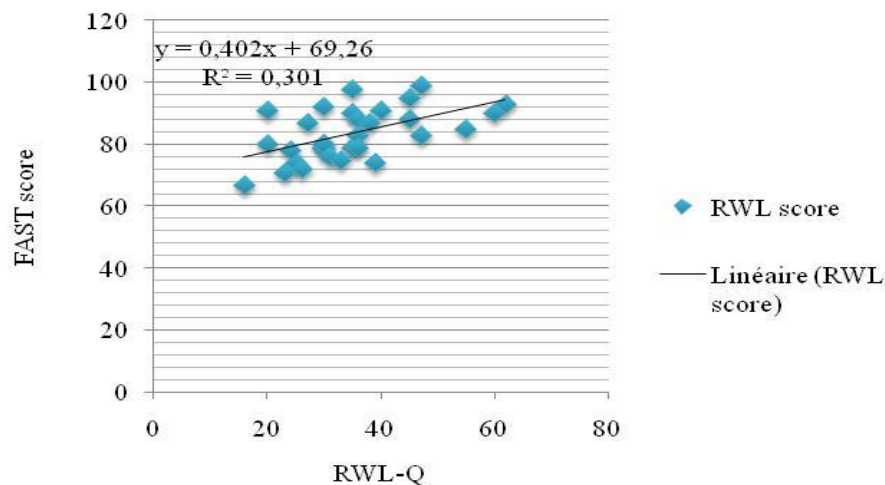
This means a significant positive correlation relationship between the independent variable RWL score and the dependent variable FAST score. After determining the prevalence of ED in high-level female judokas in the pre-competitive period which is 74.2% and the use of statistical tests of simple linear regression between the independent variable RWL score and the dependent variable FAST score with a Fisher (F), Student (t) test and a Pearson (r) correlation coefficient significant at the 0.05 level of significance and the degree of freedom (29), we conclude that there is a relationship between the RWL in the pre-competitive period and the appearance of ED in female judokas between 15 and 20 years old. Our results obtained are in agreement with the data of the literature (E. Filaire, 2007), Filaire et al, evaluated a prevalence of ED in cyclists 30.7%, judokas 25%, and gymnasts 22.3%, than in the rest of the study population. Another study (Matthew Hawkey, 2017) carried out on 25 high-level athletics athletes assessed a prevalence of ED of 48%. Sundgot-Borgen (Sundgot-Borgen J T. M., 2010) shows in a study a prevalence of 70% of high-level female athletes competing in weight-class sports and following a diet in order to make their weight before the competition, have developed abnormal eating behaviors. Persistent weight loss due to unhealthy behaviors can lead to delayed physical maturation,

stunted growth and the development of eating disorders (Carl RL, 2017).

6. Conclusion:

It is concluded that the early onset of sports practice, early participation in competitions and weight gain at puberty introduces female judokas into a continuum of eating disorders beginning with appropriate eating and physical behaviors and ending with the installation of a pathological food process in most of the time subclinical, due to the adoption of cyclical RWL strategies, by an increase in total energy expenditure from exercise inducing significant daily energy expenditure witnessing a physical compensation with water and caloric restrictions, which are at the origin of the appearance of ED. We can deduce from the results obtained a proportional relationship between the aggressiveness of RWL methods and the appearance of ED in the pre-competitive period. In our study, we could not determine the threshold of exercise-related energy expenditure at which ED will appear, so let's leave the opportunity to other researchers to answer the question.

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