

## Pathogenic Weight-Cutting Practices in Turkish Adolescent Judo Athletes

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## Abstract

**Objectives:** The aim of this study was to examine prevalence of pathogenic weight-cutting practices and perceived problems during weight-cutting periods of Turkish adolescent judo athletes.

**Methods:** A questionnaire which was designed by the researcher to assess the pathogenic weight-cutting practices of adolescent judo athletes was administered to 159 judo athletes (88 men and 71 women) from 12 different cities of Turkey.

**Results:** The judo players had an average age of  $14.53 \pm 2.55$  years, a mean body weight of  $54.96 \pm 14.63$  kg., and a mean height of  $162.58 \pm 11.40$  cm. National team membership ratio of the players was 24%. The mean number of years of experience in judo was  $4.76 \pm 3.22$  years. The mean age for starting to use rapid weight-cutting practices was  $12.29 \pm 2.57$  years. Prevalences of pathogenic weight-cutting practice were 3.1% for self-induced vomiting, 5.0% for diet pills, 5.0% for laxatives and 4.4% for diuretics. The most preferred other weight-cutting methods were exercising with rubber or plastic suits (58.5%), skipping meals (52.2%), going hungry or fasting (48.4%), fluid restriction (32.7%) and saunas (22.6%). The primary sources of information on promoting rapid weight-loss methods were coaches (57.2%), own method (37.1%), friends (24.5%) and parents (11.9%). The most perceived health or performance problems during weight-cutting periods were excessive fatigue (56.0%), feeling excessively thirsty (41.5%), decrease in physical performance (41.5%) and aversion to training (33.3%). Moreover, reported ratio of binge-eating episodes was 54.7%.

**Conclusion:** The results of this study revealed that rapid weight-cutting practices are highly prevalent in Turkish adolescent judo players. Because of the fact that pathogenic

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weight-cutting practices impair growth, development and physical performance, the players, their coaches and parents should be trained about the detrimental effects of rapid weight-cutting practices on performance and health.

**Key Words:** *Adolescent judo players, Pathogenic weight cutting, Perceived problems*

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## **Introduction**

Bodybuilding, boxing, wrestling, weightlifting and martial arts such as judo are known as weight category sports (Wilmore, 2000). In almost all combat sports, athletes are classified according to their body weight, so the matches are more equitable in terms of body size, strength and agility (Franchini et al., 2012; Langan-Evans et al., 2011; Artioli et al., 2009). However, the vast majority of combat athletes reduce their body weight rapidly to gain some advantage against weaker and smaller opponents by qualifying in a lighter weight class (Mendes et al., 2013; Artioli et al., 2010a). These rapid weight-cutting practices range from fasting, dieting, fluid restriction, food restriction, saunas, wearing more clothes during training and exercising with rubber or plastic suits to more pathogenic methods such as diuretics, laxatives, and self-induced vomiting (da Silva Santos et al., 2016; Coufalova et al., 2013; Kazemi, Rahman & de Ciantis, 2011). Researchers reported that rapid weight-cutting practices lead to very serious health problems such as hormonal imbalance, hyperthermia, hydroelectrolytic imbalance, cardiovascular distress, reduced immune functions, reduced cognitive functions and negative mood profile, and may even lead to death (Mendes et al., 2013; Langan-Evans et al., 2011; Fleming & Costarelli, 2009).

In addition, these methods could cause impairment of flexibility, reduction of muscle strength, power and endurance, increase in resting and submaximal heart rate, and decrease in cardiac stroke volume (Koral & Dosseville, 2009; Boisseau, Perez & Poortmans, 2005). It is known that the adolescence period is one of the most important stages in human life, when physical growth, sexual development and psychosocial maturation take place (Rogol, Clark & Roemmich, 2000; Parlaz et al. 1999). Boisseau, Vera-Perez & Poortmans (2005), Horswill et al. (1990) and Brownell, Steen & Wilmore (1987) reported that application of rapid weight loss methods during adolescence may lead to negative effects on the growth and maturation process, due to high physical stress and altered protein metabolism in adolescent athletes.

Therefore, the aim of the present study was to examine prevalence of aggressive weight-cutting practices (self-induced vomiting, diet pills, laxatives and diuretics) as well as of other rapid weight loss methods (saunas, fluid restriction, exercising with rubber or plastic

suits, skipping meals, etc.) and perceived problems during weight-cutting periods of Turkish adolescent judo athletes.

## **Method**

### **Participants**

159 adolescent judo athletes (88 men and 71 women) from 12 different cities of Turkey volunteered to participate in the study. The questionnaires were administered to the athletes during an international judo tournament which was held in Sakarya province of Turkey in 2017. The membership ratio and former membership ratio of the national team were 15.1% and 9.4% respectively, whereas 74.8% of the respondents had never been in the national team. Educational status of the athletes was secondary school (39.6%), high school (47.8%), university (10.7%) and master of science (0.6%). Inclusion criteria were determined as: respondents needed to be in the adolescence period, to be active combat athletes, to have experience of rapid weight loss practices, to have experience of at least one official judo competition, and not to be a heavyweight athlete (>100kg). Players that had no competitive experience were excluded from the study due to the fact that they had no weight reduction experience.

### ***Questionnaire***

A questionnaire was created by the researchers of the study in the light of the present literature (Berkovich et al., 2016; Coufalova et al., 2013; Artioli et al., 2010b; Oppliger, Steen, & Scott, 2003) to assess the pathogenic weight-cutting practices of the adolescent judo athletes. It was composed of 24 mixed type questions and evaluated six areas including; 1) demographic information, 2) acute weight-cutting methods and sources of information on acute weight-cutting 3) amount of reduced body weight and extent of weight-cutting period 4) perceived problems during weight-cutting period 5) eating attitudes of the players' after competition 6) whether they were receiving education for weight control and the source of this education.

### ***Statistical Analysis***

The Kolmogorov-Smirnov test was performed to test for normality. The descriptive statistics for the respondents were expressed as mean  $\pm$  standard deviation (SD). The responses to the questionnaire were also expressed as frequencies (percentages).

## **Results**

Demographic and descriptive characteristics of the players are given in table 1. Pathogenic weight-cutting methods used by the athletes and the most frequently used rapid

weight-cutting methods except for pathogenic methods are given in tables 2 and 3 respectively. Moreover, the primary sources of information on promoting rapid weight-cutting methods and the most perceived problems during weight-cutting periods are given in tables 4 and 5 respectively. The respondents reduced their body weight by an average of  $3.61 \pm 2.29$  kg within a week. The players reported that frequency of usage of these methods in a year were 1-2 times (45.3%), 3-5 times (34.6%), 5-10 times (8.8%) and 10 times and over (5.7%). The ratio of subjects who were trying to regain the lost weight was 62.3%. The majority of the respondents (77.9%) declared that they had no assistance in weight management from an expert such as a dietitian, physician, etc. 21.40% of the respondents declared that they had taken training for body weight management. These experts were a dietitian (10.7%), their coach (6.3%), a life coach (9.7%) and a physician (0.6 %). Moreover, the ratio of reported binge-eating episodes was 54.70 %. The ratio of players' who reported binge eating before a competition (right after the *weigh-in*) and right after the competition were 5.0% and 24.5% respectively.

**Table 1. Demographic and descriptive characteristics of the players**

Variable	Mean $\pm$ SD
Age (years)	14.53 $\pm$ 2.55
Body weight (kg)	54.96 $\pm$ 14.63
Height (cm)	162.58 $\pm$ 11.40
Age they began cutting weight rapidly (years)	12.29 $\pm$ 2.57
Experience in judo (years)	4.76 $\pm$ 3.22
Training volume (h/week)	11.57 $\pm$ 5.14

**Table 2. Pathogenic weight-cutting methods used by the athletes**

Methods	Percentage and frequency
Diet pills	5.0% (n=8)
Laxatives	5.0% (n=8)
Diuretics	4.4% (n=7)
Self-induced vomiting	3.1% (n=5)

**Table 3. The most frequently used methods of rapid weight-cutting except for pathogenic methods**

<b>Methods</b>	<b>Percentage and frequency</b>
Exercising with rubber or plastic suits	58.5% (n=93)
Skipping meals	52.2% (n=83)
Fasting or going hungry	48.4% (n=77)
Increased exercise	40.3% (n=64)
Restricting fluids	32.7% (n=52)
Eating the same food for every meal	28.3% (n=45)
Heated room	24.5% (n=39)
Sauna	22.6% (n=36)
Fat burner	6.3% (n=10)

**Table 4. The primary source of information on promoting rapid weight-cutting methods**

<b>Source</b>	<b>Percentage and frequency</b>
Their coach	57.2% (n=91)
Own method	37.1% (n=59)
Their friends	24.5% (n=39)
Their parents	11.9% (n=11)
Athletes in different combat sports	8.8% (n=14)
Club manager	8.8% (n=14)
Former judo players	6.9% (n=11)

**Table 5. The most perceived problems during weight-cutting periods**

<b>Perceived problem</b>	<b>Percentage and frequency</b>
Excessive fatigue	56.0% (n=89)
Feeling excessively thirsty	52.8% (n=84)
Feeling excessively hungry	41.5% (n=66)
Decline in physical performance	41.5% (n=66)
Aversion to training	33.3% (n=53)
Bad mood/irritability	31.4% (n=50)
Decline in attention	29.6% (n=47)

Insomnia	20.1% (n=32)
Imperfection	13.2% (n=21)

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### **Discussion and Conclusion**

To the best of our knowledge, this study may be the first study aiming to examine prevalence of pathogenic weight-cutting practices and perceived problems during weight-cutting periods of Turkish adolescent judo athletes. The adolescent period is described as the period when people are aged between 10-19([http://www.who.int/topics/adolescent\\_health/en/](http://www.who.int/topics/adolescent_health/en/)). According to the description of adolescence by the World Health Organization (WHO), we concluded that Turkish adolescent judo athletes started weight-cutting practices in their adolescent period ( $12.29 \pm 2.57$  years). This is not a surprise to us because other researchers have also reported that judo athletes start weight-cutting during their adolescent period (Artioli et al., 201a; Berkovich et al., 2016). Berkovich et al. (2016) reported that Israeli Judo athletes started weight-cutting aged  $12.5 \pm 2.2$  years. Moreover, we understood from the study of Artioli et al. (2010a) that Brazilian judo athletes started rapid weight-cutting aged  $12.6 \pm 6.1$  years.

It is known that all the rapid weight-cutting practices give harm to athletes' health and performance, but that pathogenic weight-cutting methods (self-induced vomiting, diet pills, diuretics and laxatives) are more harmful than other methods (Artioli et al., 2009). Usage prevalence of these pathogenic weight-cutting practices by Brazilian adolescent judo athletes were 3.0% for laxatives, 2.0% for diuretics, 0.9% for diet pills and 0.2% for self-induced vomiting. On the other hand, Berkovich et al. (2016) reported that Israeli female judo athletes aged 12-17 answered a questionnaire as "never used" for laxatives, diuretics, diet pills and self-induced vomiting. In their study of the usage of pathogenic weight-cutting practices by college wrestlers, Oppliger, Steen & Scott (2003) reported the use of diet pills as 3.9% once per month or more. Laxative use occurred among 3.2% once per month or more. Diuretics were used by 2.8% of the wrestlers once per month or more, vomiting by 1.9% and enemas by 1.2%. Although we did not evaluate usage frequency of these methods as in a week/month or always, never etc, we can say that our subjects reported a higher percentage usage of these methods for diet pills (5%), laxatives (5%), diuretics (4.4%) and self-induced vomiting (3.1%). These results may be due to the characteristics of the questionnaire used for this study.

The methods used for rapid weight-cutting reported in this study did not differ from methods reported in the literature (Berkovich et al., 2016; Artioli et al., 2009; Boisseau, Perez & Poortmans, 2005), and were predominately based on dehydration techniques (for this study, exercising with rubber or plastic suits 58.5%, and restricting fluids 32.7%), and caloric restriction (for this study, skipping meals 52.2%, and fasting or going hungry 48.4%).

Researchers reported that rapid weight-cutting methods negatively affect the profile of mood state and cognitive function, decrease short term memory, affect concentration, and cause dizziness, headache and nausea as well as increasing fatigue, aversion to physical activity, loss of strength and nervousness (Berkovich et al., 2016; Coufalova et al., 2013; Artioli et al., 2009). In addition to the literature our subjects have reported excessive fatigue (56.0%), excessive thirst (52.8%), excessive hunger (41.5%), bad mood and irritability (31.4%) and insomnia (20.1%) as perceived problems during rapid weight reduction periods.

According to the literature, coaches and fellow combat athletes as well as parents are primary influences on choosing methods of rapid weight-cutting (Coufalova et al., 2013; Franchini, Brito & Artioli, 2012; Sansone & Sawyer, 2005; Oppliger, Steen & Scott, 2003). In this present study it is shown that the primary source of information on promoting rapid weight-cutting methods are coaches (57.2%), own method (37.1%), friends (24.5%) and parents (11.9%), as similar with the literature.

Kinningham & Gorenflo (2001) suggested that rapid weight loss practices may lead to eating disorders like bulimia nervosa. 44.8% of the college wrestlers reported often or always dieting (Oppliger, Steen & Scott, 2003). In addition to this, Kinningham & Gorenflo (2001) reported that almost 40% of wrestlers engage in binge eating during the wrestling season. In our study, the ratio of binge eating episodes was 54.7%.

In this study, another interesting finding is that the subjects reported at a rate of 75.5 % that they had never received advice or training on healthy eating and weight management. The remaining judo athletes reported having received training or advice from somebody such as a dietitian (10.7 %), coach (6.3%), life coach (1.9%) and physician (0.6%).

We concluded that Turkish adolescent judo athletes engaged in rapid weight-cutting methods to a large extent. Evidence suggests that weight loss during adolescence adversely affects hormonal balance, possibly interfering with growth and development (Santos et al., 2016). Therefore, *The Ministry of Youth and Sports of Turkey and sports federations should make regulations about weight management for weight category sports.* Various educational programs should aim at increasing athletes', coaches' and parents' awareness of the risks of



rapid weight-cutting methods. Studies of this kind should be carried out with larger samples to research more deeply into the problem and to produce a larger number of figures.

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Authors have no conflict of interest to declare.

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