ITALIA CONI
SCUOLA DELLO SPORT
MARCHE

La gestione nutrizionale negli sport da combattimento

Ancona, 27 maggio 2017

La gestione del peso

ADI ONLUS
Associazione Italiana di Dietetica e Nutrizione Clinica
SEZIONE MARCHE

Dr. Danilo Gambarara

Esistono sport in cui una elevata massa grassa (e corporea) costituisce un ostacolo alla prestazione

Sport "contro la gravità"

Esistono sport in cui una elevata massa grassa (e corporea) può costituire un ostacolo alla prestazione

Sport "a giudizio estetico"

O determina la categoria d'appartenenza

In altri la percentuale di massa grassa ha importanza più relativa

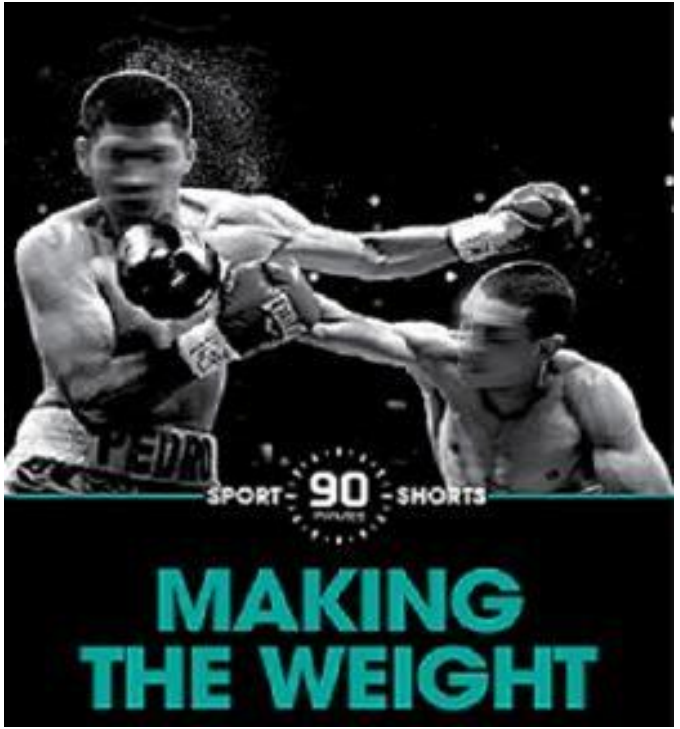
In altri ancora una elevata massa corporea, indipendentemente dalle sue componenti risulta vincente

PERCHE' L'ATLETA E' INDOTTO A PERDERE PESO?

- per entrare in categorie di peso inferiori
- per motivazioni estetiche
- perché si presume che una riduzione del peso incrementi la capacità di prestazione fisica

TABELLA 31.13 – PERCENTUALI DI MASSA GRASSA RIFERITE A DIVERSE CATEGORIE DI SOGGETTI

	Maschi	Femmine
Grasso essenziale	2,0-4,0	10,0-12,0
Atleti di resistenza	6,0-8,0	14,0-16,0
Atleti	10,0-13,0	17,0-20,0
Soggetti allenati	14,0-17,0	21,0-24,0
Borderline	18,0-22,0	25,0-29,0
Obesi	> 23,0	> 30,0
Corridori di livello mondiale	6,0-8,0	14,0-18,0
Studenti universitari	12,0-17,0	20,0-27,0
Persone attive di mezza età	15,0-20,0	20,0-25,0
Persone sedentarie di mezza età	20,0-25,0	25,0-35,0
Atleti	5,0-13,0	12,0-22,0
Peso minimo	5,0	15,0
Stato di salute ottimale	10,0-15,0	18,0-30,0
Fitness ottimale	12,0-18,0	16,0-25,0
Obesità	> 25,0	> 30,0



«Weight cycling»

Rapid Weight Loss in Sports with Weight Classes

Morteza Khodaee, MD, MPH, FACSM[1]; Lucianne Olewinski, MD[1]; Babak Shadgan, MD, MSc, PhD[2]; and Robert R. Kiningham, MD, MA, FACSM[3]

1537-890X/14/06/435–441
Current Sports Medicine Reports

TABLE.

Weight-related rules in sports with weight classes.

	Number of Weight Categories, M:F	Weigh-in Procedure	Minimum Body Fat Percentage Allowed, M:F (%)	Hydration Status (Urine-Specific Gravity)	Weekly Weight Loss Percentage Allowed (%)
Wrestling					
High school*	14:14	2 to 4 h before the beginning of the competition in each category	7:12	<1.020	1.5
Collegiate*	10:10	≤2 h before the first matches begin on the first day	5:12	<1.020	1.5
Non-Olympic*	8[b]:8	The day before the beginning of the competition in each category	N/A	N/A	N/A
Olympic	6[b]:6	The day before the beginning of the competition in each category	N/A	N/A	N/A
Boxing					
Collegiate	12:10	Daily weigh-in during the competition	N/A	N/A	N/A
Olympic	10:3	Daily weigh-in during the competition	N/A	N/A	N/A
Non-Olympic	10:10	The day before the competition	N/A	N/A	N/A
Judo					
Olympic	7:7[c]	In the morning of the competition; there are at least 2 h between the weigh-in and the start of the competition	N/A	N/A	N/A
Non-Olympic*		The day before the competition or on the morning of the competition	N/A	N/A	N/A

	Number of Weight Categories, M:F	Weigh-in Procedure	Minimum Body Fat Percentage Allowed, M:F (%)	Hydration Status (Urine-Specific Gravity)	Weekly Weight Loss Percentage Allowed (%)
Mixed martial arts*	9:2	The day before or within 8 h of the starting time of the event	N/A	N/A	N/A
Horse racing (jockeys)*	1 (no gender distinction; >50 kg and >57 kg)	Target minimum riding weight will be determined based on body fat percentage and hydration status	6:12	≤1.020	N/A
Sprint football (NCAA)	1:N/A (<78 kg)	Twice a week during the seven-game season	5:N/A	<1.020	N/A
Taekwondo					
Olympic	4:4	The day before competition	N/A	N/A	N/A
Non-Olympic*	8:8	Weigh-in in the evening before competition; one weigh-in at the start of competition	N/A	N/A	N/A
Lightweight rowing					
Collegiate*	1:1 (<73 kg:<59 kg)	Once a day, 1 to 2 h before the scheduled time of the first race during the competition (weekly during the season)	N/A	N/A	N/A
Olympic	1:1 (<73 kg:<59 kg)	Once a day, 1 to 2 h before the scheduled time of the first race during the competition	N/A	N/A	N/A
Weight lifting					
Youth	8:7	2 h before the start of the competition	N/A	N/A	N/A
Olympic	8:7	2 h before the start of the competition	N/A	N/A	N/A
Non-Olympic	8:7	2 h before the start of the competition	N/A	N/A	N/A

Riduzione del peso

- **Rapida** (entro 24-72 ore)
- **Moderata** (da 72 ore a diverse settimane)
- **Graduale** (da diverse settimane a mesi)

Wilmore, J.H. (2000) Weight category sports. In: *Nutrition in Sport*

Età di inizio delle pratiche di riduzione (rapida) del peso

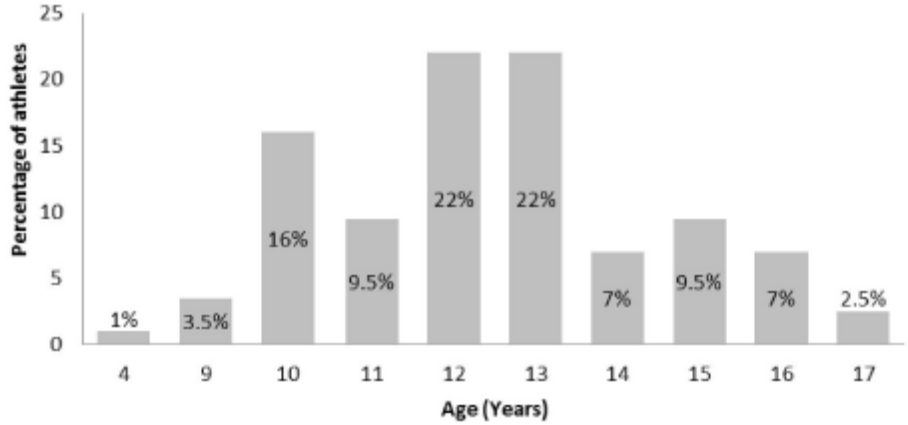
- Judo 12-15 anni (Artioli *Med Sci Sports Exerc 2010*)
- Karate, Tae Kwon Do 13.6±1.4 (Brito *Int J Sport Nutr Exerc Metab 2012*)
- Lotta 15.5±2.4 (Kordi *Sports Med Arthrosc Rehabil Ther Technol 2011*)

International Journal of Sport Nutrition and Exercise Metabolism, 2016, 26, 276-284
http://dx.doi.org/10.1123/ijsnem.2015-0196

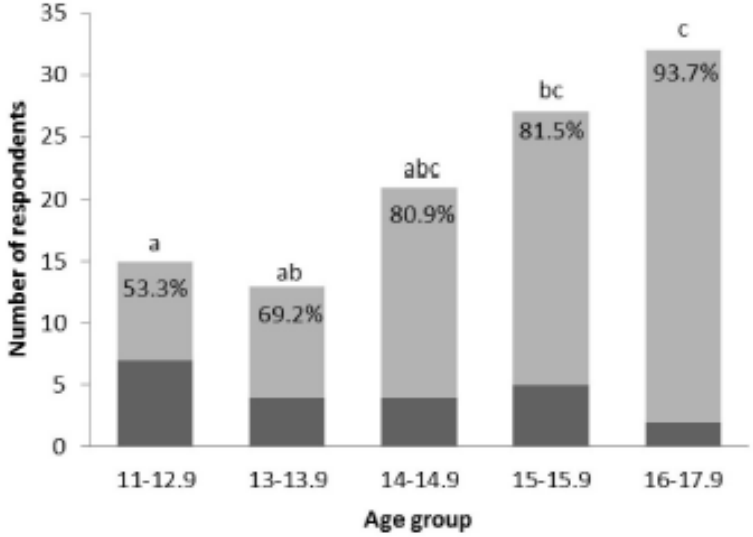
Human Kinetics
ORIGINAL RESEARCH

Rapid Weight Loss Among Adolescents Participating In Competitive Judo

Ben-El Berkovich, Alon Eliakim, Dan Nemet, Aliza Hannah Stark, and Tali Sinai



— Age of onset among the athletes practicing Rapid weight loss (RWL) methods in adolescent judo athletes ($n = 86$).



- **Atleti che adottano tecniche di rapida perdita di peso**
- **Atleti che NON adottano tecniche di rapida perdita di peso**

Eating Disorder Pathology in Elite Adolescent Athletes

(Int J Eat Disord 2016; 49:553–562)

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Anne Hermann-Werner, MD[1]
Jochen Mayer, PhD[3]
Katharina Diehl, PhD[4]
Sven Schneider, PhD[4]
Ansgar Thiel, PhD[3]
Stephan Zipfel, MD[1]

Results: High risk groups comprised (a) athletes competing in weight dependent sports, and among athletes competing in disciplines other than weight dependent sports (b) athletes who are high on negative affectivity, (c) female athletes and (d) male athletes competing in endurance, technical or power sports. Athletes competing in weight dependent disciplines reported wide spread use of compensatory behaviors to influence body weight. Athletes reporting eating disorder pathology showed higher levels of depression and anxiety than athletes without eating disorder pathology.

Journal of Human Kinetics volume 47/2015, 91-98 DOI: 10.1515/hukin-2015-0065
Section II- Exercise Physiology & Sports Medicine

DE GRUYTER OPEN

Can height categories replace weight categories in striking martial arts competitions? A pilot study

by

Gal Dubnov-Raz[1,2], Yael Mashiach-Arazi[3], Ariella Nouriel[2], Raanan Raz[2], Naama W. Constantini[4]

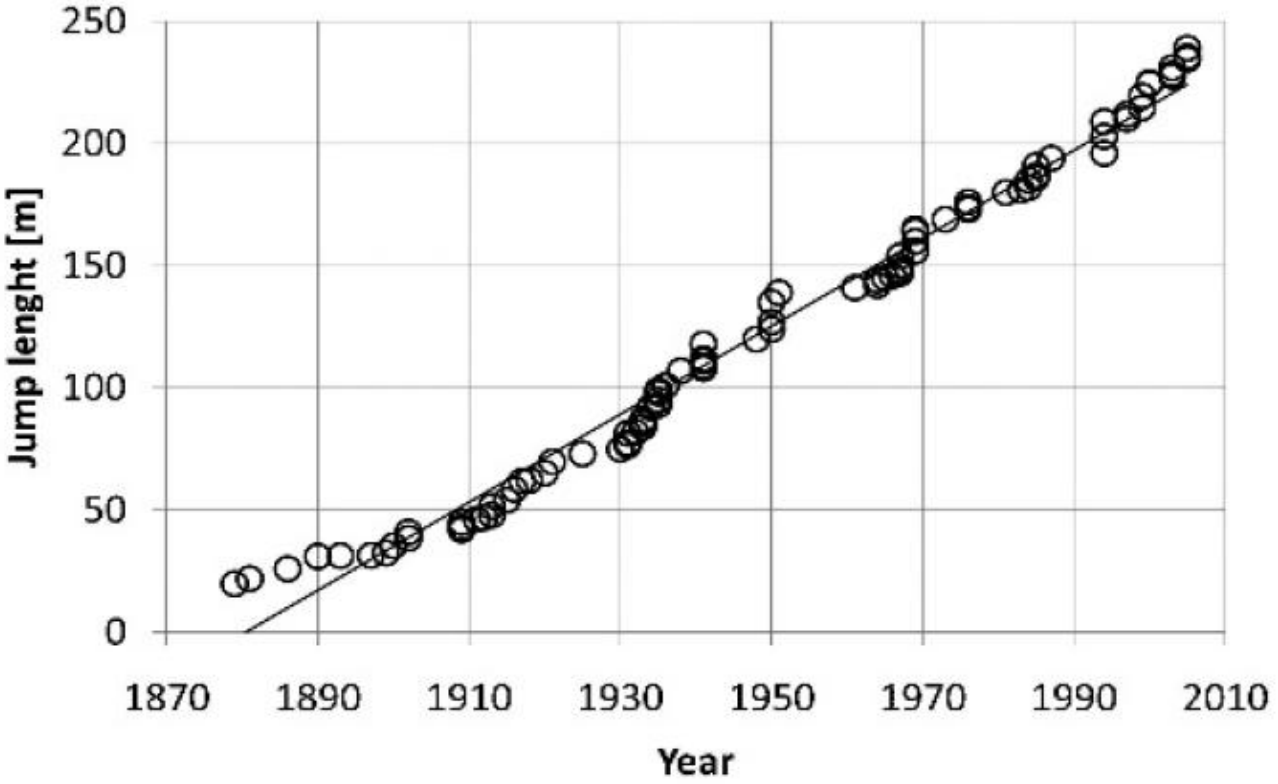
In most combat sports and martial arts, athletes compete within weight categories. Disordered eating behaviors and intentional pre-competition rapid weight loss are commonly seen in this population, attributed to weight categorization. We examined if height categories can be used as an alternative to weight categories for competition, in order to protect the health of athletes.

Height and weight of 169 child and adolescent competitive karate athletes were measured. Participants were divided into eleven hypothetical weight categories of 5 kg increments, and eleven hypothetical height categories of 5 cm increments. We calculated the coefficient of variation of height and weight by each division method. We also calculated how many participants fit into corresponding categories of both height and weight, and how many would shift a category if divided by height.

There was a high correlation between height and weight ($r = 0.91$, $p<0.001$). The mean range of heights seen within current weight categories was reduced by 83% when participants were divided by height. When allocating athletes by height categories, 74% of athletes would shift up or down one weight category at most, compared with the current categorization method.

We conclude that dividing young karate athletes by height categories significantly reduced the range of heights of competitors within the category. Such categorization would not cause athletes to compete against much heavier opponents in most cases. Using height categories as a means to reduce eating disorders in combat sports should be further examined.

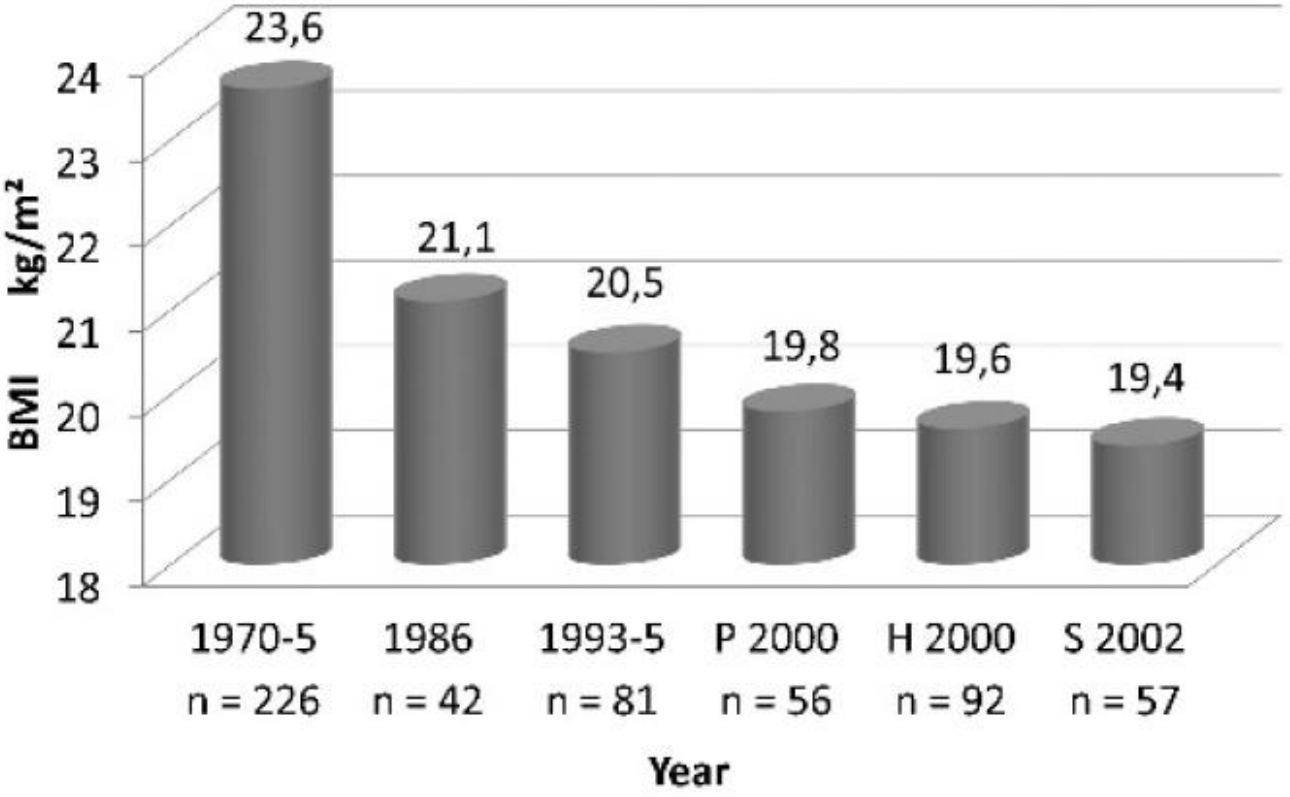
In summary, this study was motivated by the high rate of disordered eating frequently seen in sports with weight-categories, and examined a novel alternative of using height categories in striking martial arts. We showed that young competitive karate athletes can be divided by height categories for competition, with only a moderate increase in the range of weights of competitors within the category. The use of height categories in weight-class sports, and perhaps in other types of sport, should be further examined. Such categorization can potentially improve tactical aspects and equality in body size among athletes, and most importantly, serve as a means to reduce disordered eating behaviors and improve athletes' health. Therefore, we suggest that at least for the striking martial arts such as karate and taekwondo, the use of height categories for competition should be further examined.



Towards research-based approaches for solving body composition problems in sports: ski jumping as a heuristic example

W Müller

Br J Sports Med 2009;**43**:1013–1019.



Towards research-based approaches for solving body composition problems in sports: ski jumping as a heuristic example

Br J Sports Med 2009;**43**:1013–1019.

W Müller

Le regole della All World Cup adottate nella stagione 2004/2005, rapportano la lunghezza dello sci al BMI.

Nella misura del peso dell'atleta sono compresi gli scarponi e la tuta (3-4 Kg), questo si traduce in valori superiori di 1.2-1.5 rispetto al BMI dell'atleta.

Per tutti gli atleti il con valori al di sopra di 20 (cioè un BMI superiore a 18,5), la massima lunghezza dello sci (146% della statura) rimane inalterata rispetto alle stagioni precedenti.
Per valori di 19,5-20,0 (18.0-18.5) la massima lunghezza dello sci scende al 144%.
Per valori di 19-19,5 (17,5-18.0) al 142%

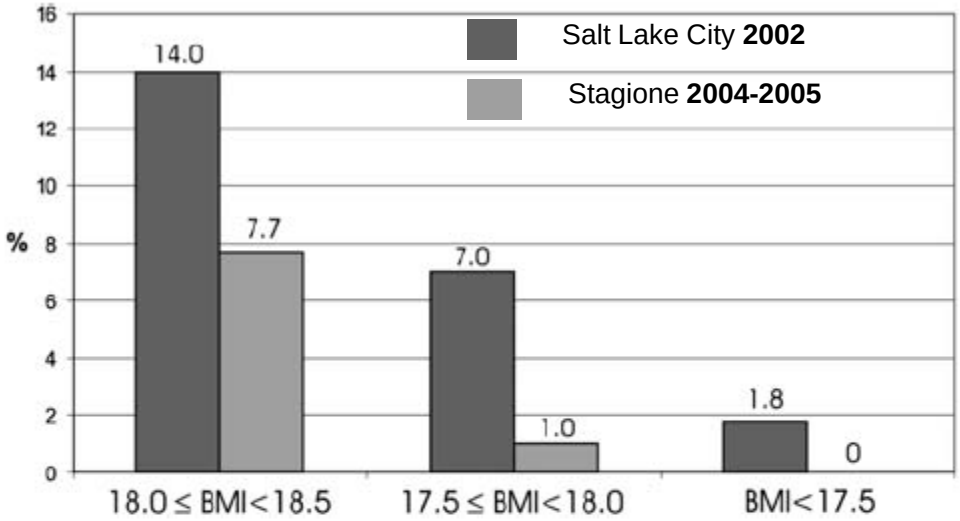


Fig. **6** Decrease of the percentage of underweight ski jumpers due to the new ski jumping regulations. Dark-grey: Percentages of underweight ski jumpers during the Olympic Games 2002; light-grey: Percentages of underweight World Cup ski jumpers in the season 2004/2005 (after the introduction of the new ski jumping regulations).

ALIMENTAZIONE DISTURBATA
rapida perdita di peso

Digiunare

Saltare i pasti

Vomitare

Assumere pillole dimagranti

Lassativi e diuretici

Tute in gomma

Bassa disponibilità energetica: disturbo dell'alimentazione che necessita di un trattamento psicologico e una gestione medica

TABLE 3. Frequency analysis of the weight loss methods reported by the judo competitors (heavyweights were excluded from analysis).

Method	Always (%)	Sometimes (%)	Almost Never (%)	Never (%)	Do Not Use Anymore (%)
Gradual dieting	18.4	34.8	16.0	21.5	9.2
Skipping one or two meals	19.3	40.6	13.5	16.6	10.0
Fasting	12.2	23.9	14.7	34.9	14.3
Restricting fluids	20.5	30.3	16.0	22.4	10.8
Increased exercise	61.7	25.0	5.3	3.3	4.7
Heated training rooms	25.5	29.8	15.0	24.3	5.5
Sauna	3.9	11.8	15.9	59.4	9.0
Training with rubber/plastic suits	18.1	21.8	10.9	35.8	13.4
Using winter or plastic suits	12.1	18.2	12.4	47.5	9.7
Spitting	18.9	27.9	17.5	27.6	8.2
Laxatives	3.0	8.3	9.3	66.5	12.9
Diuretics	2.0	6.0	8.2	71.7	12.1
Diet pills	0.9	2.2	3.8	90.1	3.0
Vomiting	0.2	3.1	3.1	90.4	3.1

ARTIOLI, G. G., B. GUALANO, E. FRANCHINI, F. B. SCAGLIUSI, M. TAKESIAN, M. FUCHS, and A. H. LANCHA. Prevalence, Magnitude, and Methods of Rapid Weight Loss among Judo Competitors. *Med. Sci. Sports Exerc.*, Vol. 42, No. 3, pp. 436–442, 2010.

Table 2 Health and performance consequences of various extreme weight control behaviours

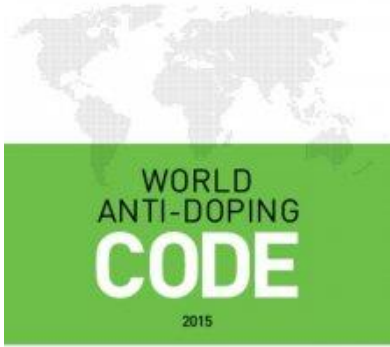
Weight control behaviour	Physiological effects and health consequences	Effect on performance
Fasting or starvation	Energy and nutrient deficiency, glycogen depletion, loss of lean body mass, a decrease in metabolic rate and reduced bone mineral density	Poor exercise performance due to general weakness, reduced ability to cope with pressure, decreased muscle force, and increased susceptibility for diseases and injuries
Diet pills	Typically function by suppressing appetite and may cause a slight increase in metabolic rate. May induce rapid heart rate, anxiety, nervousness, inability to sleep and dehydration. Any weight lost is quickly regained once use is discontinued	Indirectly results in poor performance and may be classified as doping
Laxatives or enemas	Weight loss is primarily water and any weight lost is regained once use is discontinued. Dehydration and electrolyte imbalances, constipation, cathartic colon and steatorrhoea (excessive fat in the faeces) are common	May affect concentration and hydration status. May be addictive and athlete can develop resistance, thus requiring larger and larger doses to produce the same effect
Diuretics	Weight loss is primarily water and any weight lost is quickly regained once use is discontinued. Dehydration and electrolyte imbalances are not uncommon	Poor performance and classified as doping
Self-induced vomiting	Large body water losses can lead to dehydration and electrolyte imbalances. Gastrointestinal problems, including oesophagitis, oesophageal perforation and oesophageal ulcers may occur	May lead to electrolyte imbalance. Largely ineffective in promoting weight (body fat) loss
Saunas	Dehydration and electrolyte imbalances can occur in extreme cases	Weight loss is primarily water and any weight lost is quickly regained once fluids are replaced
Excessive exercise	If combined with low energy availability it will increase risk of staleness, chronic fatigue, illness, overuse, injury and menstrual dysfunction	Experience the effect of lack of recovery

Modified from Beals.[30]

Sports Med. 2016 Apr 21.

It is Time to Ban Rapid Weight Loss from Combat Sports.

Artioli GG[1], Saunders B[2], Iglesias RT[3], Franchini E[4].



Secondo il World Anti Doping Agency Code un metodo proibito deve soddisfare almeno due dei seguenti criteri:

1. migliorare le prestazioni,
2. essere un pericolo per la salute di un atleta,
3. violare lo spirito etico di questo sport.

Secondo gli autori la perdita di peso rapida risponde chiaramente tutti e tre i criteri e, di conseguenza, dovrebbe essere vietata e, citando il World AntiDoping Agency Code, questo per "*proteggere degli atleti e garantire il diritto fondamentale a partecipare ad uno sport libero dal doping e promuovere la quindi salute, l'equità e l'uguaglianza*".

ALIMENTAZIONE DISTURBATA

Diminuzione apporto liquidi

Incremento perdita acqua

Apporto cibo limitato

Disidratazione

Riserve di glicogeno nel corpo ridotte

Capacità dei sistemi tampone ridotta

Funzioni fisiologiche ridotte

CAPACITA' DI PRESTAZIONE FISICA COMPROMESSA

POSSIBILI EFFETTI SULLA PRESTAZIONE

PEGGIORAMENTO ASSOLUTO

Disidratazione, riduzione del volume plasmatico con aumento viscosità ematica, alterata termoregolazione, alterazioni croniche ed acute regolazione ormonale, (rischio osteoporotico, disturbi funzione immunitaria, induzione DCA latenti).

MIGLIORAMENTO RELATIVO

Vantaggio di competere in una classe di peso inferiore con avversari potenzialmente più piccoli, leggeri e meno potenti.

Anche se la maggior parte degli esperti concorda che le procedure di rapida perdita di peso influiscano negativamente sulla performance sportiva sia di tipo aerobico che anaerobico, esistono relativamente pochi, non decisivi ed a volte contraddittori studi a riguardo, basati su gruppi non sempre omogenei per età e livello prestativo.

Scand J Med Sci Sports 2016: 26: 507–517
doi: 10.1111/sms.12485

SCANDINAVIAN JOURNAL OF
MEDICINE & SCIENCE
IN SPORTS

Rapid body mass loss affects erythropoiesis and hemolysis but does not impair aerobic performance in combat athletes

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Accepted for publication 25 March 2015

Rapid body mass loss (RBML) before competition was found to decrease hemoglobin mass (Hb_{mass}) in elite boxers. This study aimed to investigate the underlying mechanisms of this observation. Fourteen well-trained combat athletes who reduced body mass before competitions (weight loss group, WLG) and 14 combat athletes who did not practice RBML (control group, CON) were tested during an ordinary training period (t-1), 1–2 days before an official competition (after 5–7 days RBML in WLG, t-2), and after a post-competition period (t-3). In WLG, body mass (–5.5%, range: 2.9–6.8 kg) and Hb_{mass} (–4.1%) were significantly ($P < 0.001$) reduced after RBML and were still decreased by 1.6% ($P < 0.05$) and 2.6% ($P < 0.001$) at t-3 compared with t-1. After RBML, erythropoietin, reticulocytes, haptoglobin, triiodothyronine (FT_3), and free androgen index (FAI) were decreased compared with t-1 and t-3. An increase occurred in ferritin and bilirubin. Peak treadmill-running performance and VO_{2peak} did not change significantly, but performance at 4-mmol lactate threshold was higher after RBML ($P < 0.05$). In CON, no significant changes were found in any parameter. Apparently, the significant decrease in Hb_{mass} after RBML in combat athletes was caused by impaired erythropoiesis and increased hemolysis without significant impact on aerobic performance capacity.

Physiological and psychological performance of taekwondo athletes is more affected by rapid than by gradual weight reduction

Woo-Hwi Yang[1,4ABCD], Marijke Grau[3D], Pilsang Kim[3B], Anke Schmitz[3B], Oliver Heine[4AE], Wilhelm Bloch[2,3E], Joachim Mester[1,2E]

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[2] German Research Centre for Elite Sports, German Sport University, Cologne, Germany
[3] Institute of Cardiology and Sports Medicine, Section of Molecular and Cellular Sport Medicine, German Sport University, Cologne, Germany
[4] Olympic Training Centre Rheinland, Cologne, Germany

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CONCLUSION

The findings of the present study showed that RWR is less suitable prior to competition compared to GWR. The lowered kick-frequency in RWR was caused by rapid loss of body fluid but also, psychological aspects can still reinforce this effect, which may induce the detrimental decline of the performance on the competition day. The GWR period proved overall better findings as well as an increase in kick-frequency, blood indicators and psychological mood state. For this reason, trainers and TKD athletes should educate about the adverse consequences of this short-term fasting and dehydration on physiological and psychological condition and performance. In respect thereto, the GWR should be planed as a better method of weight reduction for an optimal competitive preparation of the TKD athletes and to avoid a potential decline of the performance in the course of several competitions.

Table 1: Acceptable Weight-loss Boundaries for the Female Junior Weight Categories

Weight division	Maximum acceptable weight loss							
	Non-competition period		4-8 wks before competition		2 wks before competition		48 hr before competition	
	5%		4%		3%		≤2% of hydrated weight	
	Loss	From	Loss	From	Loss	From	Loss	From
-42 kg	2.1 kg	44.1 kg	1.7 kg	43.7 kg	1.3 kg	43.3 kg	0.8 kg	42.8 kg
-44 kg	2.2 kg	46.2 kg	1.7 kg	45.7 kg	1.3 kg	45.3 kg	0.9 kg	44.9 kg
-46 kg	2.3 kg	48.3 kg	1.8 kg	47.8 kg	1.4 kg	47.4 kg	0.9 kg	46.9 kg
-49 kg	2.5 kg	51.5 kg	2.0 kg	51.0 kg	1.5 kg	50.5 kg	1.0 kg	50.0 kg
-52 kg	2.6 kg	54.6 kg	2.0 kg	54.0 kg	1.6 kg	53.6 kg	1.0 kg	53.0 kg
-55 kg	2.7 kg	57.7 kg	2.2 kg	57.2 kg	1.7 kg	56.7 kg	1.1 kg	56.1 kg
-59 kg	2.9 kg	61.9 kg	2.3 kg	61.3 kg	1.8 kg	60.8 kg	1.2 kg	60.2 kg
-63 kg	3.1 kg	66.1 kg	2.5 kg	65.5 kg	1.9 kg	64.9 kg	1.2 kg	64.2 kg
-68 kg	3.4 kg	71.4 kg	2.7 kg	70.7 kg	2.0 kg	70.0 kg	1.0 kg	69.4 kg
+68 kg	-		-		-		-	

24 hours before competition, the athlete should be no more than 0.5 kg over their fighting weight. This is to avoid excessive training or dehydration techniques to make the weight.

Table 2: Acceptable Weight-loss Boundaries for the Male Junior Weight Categories

Weight division	Maximum acceptable weight loss							
	Non-competition period		4-8 wks before competition		2 wks before competition		48 hr before competition	
	5%		4%		3%		≤2% of hydrated weight	
	Loss	From	Loss	From	Loss	From	Loss	From
-45 kg	2.2 kg	47.2 kg	1.8 kg	46.8 kg	1.3 kg	46.3 kg	0.9 kg	45.9 kg
-48 kg	2.4 kg	50.4 kg	1.9 kg	49.9 kg	1.4 kg	49.4 kg	0.9 kg	48.9 kg
-51 kg	2.5 kg	53.5 kg	2.0 kg	53.0 kg	1.5 kg	52.5 kg	1.0 kg	52.0kg
-55 kg	2.7 kg	57.7 kg	2.2 kg	57.2 kg	1.7 kg	56.7 kg	1.1 kg	56.1 kg
-59 kg	2.9 kg	61.9 kg	2.3 kg	61.3 kg	1.8 kg	60.8 kg	1.2 kg	60.2 kg
-63 kg	3.1 kg	66.1 kg	2.5 kg	65.5 kg	1.9 kg	64.9 kg	1.2 kg	64.2 kg
-68 kg	3.4 kg	71.4 kg	2.7 kg	70.7 kg	2.0 kg	70.0 kg	1.4 kg	69.4 kg
-73 kg	3.6 kg	76.6 kg	2.9 kg	75.9 kg	2.2 kg	75.2 kg	1.5 kg	74.5 kg
-78 kg	3.9 kg	81.9 kg	3.1 kg	81.1 kg	2.3 kg	80.3 kg	1.6 kg	79.6 kg
+78 kg	-		-		-		-	

Journal of Sports Sciences, January 1st 2010; 28(1): 21–32

Routledge
Taylor & Francis Group

Rapid weight loss followed by recovery time does not affect judo-related performance

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Abstract

In this study, we investigated the effects of rapid weight loss followed by a 4-h recovery on judo-related performance. Seven weight-cycler athletes were assigned to a weight loss group (5% body weight reduction by self-selected regime) and seven non-weight-cyclers to a control group (no weight reduction). Body composition, performance, glucose, and lactate were assessed before and after weight reduction (5–7 days apart; control group kept weight stable). The weight loss group had 4 h to re-feed and rehydrate after the weigh-in. Food intake was recorded during the weight loss period and recovery after the weigh-in. Performance was evaluated through a specific judo exercise, followed by a 5-min judo combat and by three bouts of the Wingate test. Both groups significantly improved performance after the weight loss period. No interaction effects were observed. The energy and macronutrient intake of the weight loss group were significantly lower than for the control group. The weight loss group consumed large amounts of food and carbohydrate during the 4-h recovery period. No changes were observed in lactate concentration, but a significant decrease in glucose during rest was observed in the weight loss group. In conclusion, rapid weight loss did not affect judo-related performance in experienced weight-cyclers when the athletes had 4 h to recover. These results should not be extrapolated to inexperienced weight-cyclers.

Una moderata disidratazione (3-4% pc) diminuisce la resistenza muscolare in un esercizio ad alta intensità ma non il picco di forza massima

Lambert C, Jones B. Alternatives to rapid weight loss in U.S. wrestling. Int. J. Sports Med. 2010

In due gruppi di atleti di sport di combattimento nessuna variazione nella performance prima e dopo una perdita di peso nel gruppo a calo rapido rispetto a quello di calo del peso graduale.

Mendes SH, Tritto AC, Guilherme JP, et al. Effect of rapid weight loss on performance in combat sport male athletes: does adaptation to chronic weight cycling play a role? Br. J. Sports Med. 2013

Consistente diminuzione di performance nel gruppo di judoka con "perdita di peso" rispetto al gruppo di controllo

Degoutte F, Jouanel P, Be`gue RJ, et al. Food restriction, performance, biochemical, psychological, and endocrine changes in judo athletes. Int. J. Sports Med. 2006

Diminuzione della prestazione negli esercizi di judo di durata di oltre 30" ma non di quelli di 5" rispetto al gruppo di controllo

Koral J, Dosseville F. Combination of gradual and rapid weight loss: effects on physical performance and psychological state of elite judo athletes. J. Sports Sci. 2009

EFFETTI SULLA SALUTE

Estreme disidratazioni, conseguenti a perdite di peso maggiori del 5% in 1-2 giorni, possono causare una diminuzione del volume plasmatico, con conseguente diminuzione della gittata sistolica, aumento della frequenza cardiaca e ridotta differenza artero-venosa di ossigeno durante l'esercizio fisico sub-massimale. Questi cambiamenti possono ridurre il flusso renale, causare anomalie elettrolitiche aumentando il rischio di colpo di calore e crampi muscolari.
Questi cambiamenti sono comunque rapidamente reversibili entro un'ora con una adeguata reidratazione (*Rankin JW. Weight loss and gain in athletes. Curr. Sports Med. Rep. 2002*)

Altri effetti possibili sono disturbi della crescita, diminuzione formazione ossea, diminuzione metabolismo basale e la perdita di massa magra con bilancio proteico negativo, anche queste a carattere transitorio *(Artioli J. Int. Soc. Sports Nutr. 2010, Oppliger RA, Med. Sci. Sports Exerc. 1996; Pettersson J. Athl. Train. 2013)*

Altrettanto transitorie e che tendono a normalizzarsi fuori dalla stagione agonistica perturbazioni nell'asse ipotalamo-ipofisi-surrene e del fattore di crescita insulino-simile sono stati trovati in lottatori *(Roemmich JN, J. Appl. Physiol. 1997)* ed alterata secrezione di progesterone associata a perdita di peso e turbe del ciclo mestruale in atlete leggere di canottaggio femminile *(Morris FL,. Br. J. Sports Med. 1999)*

La **funzione immunitaria** è stata valutata poco prima e dopo un campionato nazionale universitario di judo classificando gli atleti in tre gruppi in base alla % di peso perso: leucociti neutrofili e linfociti sono rimasti invariati in tutti i gruppi ma nel gruppo che ha perso più peso era significativamente diminuita l'attività fagocitaria. Lo studio non riportava se questo si fosse tradotto in una maggiore frequenza di malattie infettive *(Kowatari K, Med. Sci. Sports Exerc. 2001)*.

Un solo studio *(Green CM Scand. J. Med. Sci. Sports. 2007)* ha messo in relazione il **rischio di infortuni** con la perdita rapida di peso: gli atleti con perdita rapida superiore al 5% pc avevano un rischio di infortunio significativamente superiore (36.8%) rispetto a chi non aveva perso peso (14.6%).

Estesi studi epidemiologici hanno dimostrato che il "weight cycling" nella popolazione normale è associato ad un maggiore aumento negli anni del BMI ed al rischio di sviluppo di diabete di tipo 2 e patologie cardiovascolari.
Gli studi sul comportamento negli anni del BMI negli atleti che hanno praticato per lunghi periodi il "weight cycling" rispetto agli altri atleti e alla popolazione normale hanno dato risultati contradditori.

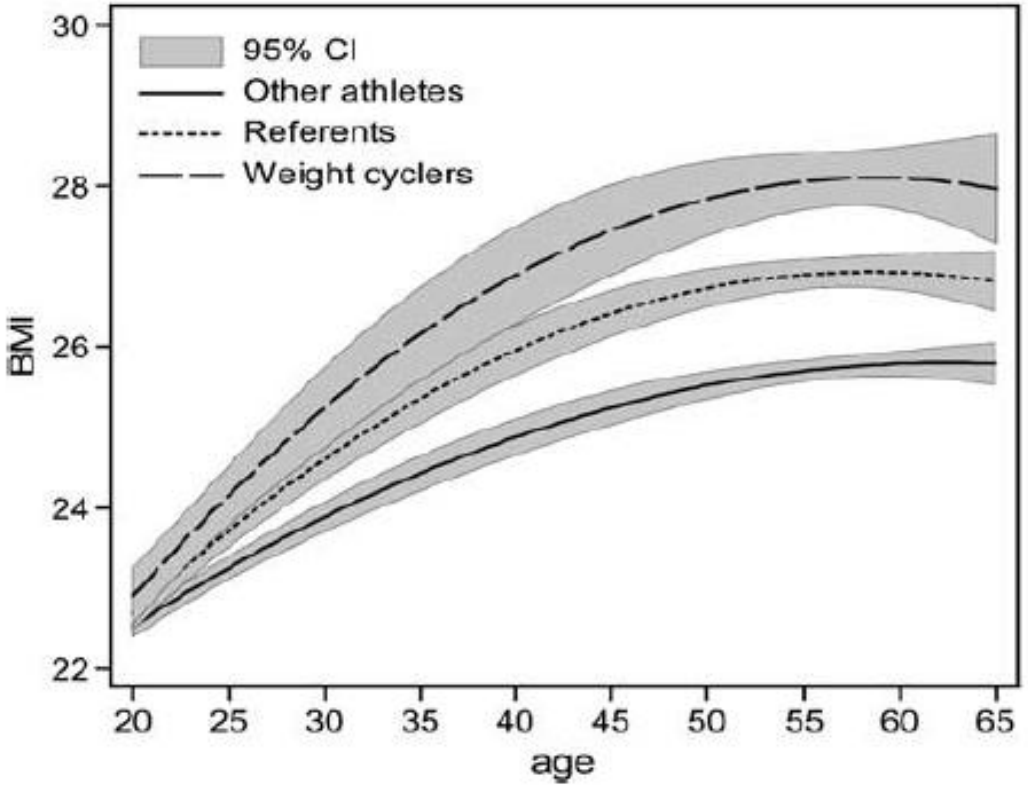
International Journal of Obesity (2006) 30, 1639–1644

0307-0565/06
www.nature.com/ijo

ORIGINAL ARTICLE

Weight cycling of athletes and subsequent weight gain in middleage

SE Saarni[1], A Rissanen[2], S Sarna[1], M Koskenvuo[1] and J Kaprio[1,3]



Conclusions: Repeated cycles of weight loss and regain appear to enhance subsequent weight gain and may predispose to obesity. Chronic dieting with weight cycling may be harmful for permanent weight control.

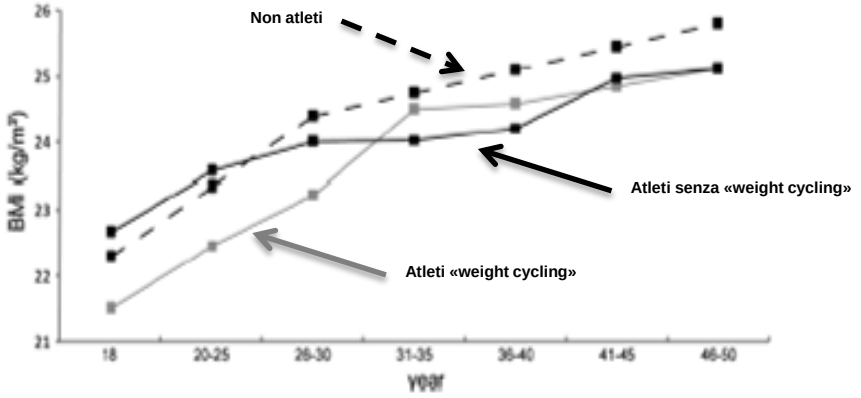
Marquet et al. BMC Public Health 2013, 13:510
http://www.biomedcentral.com/1471-2458/13/510

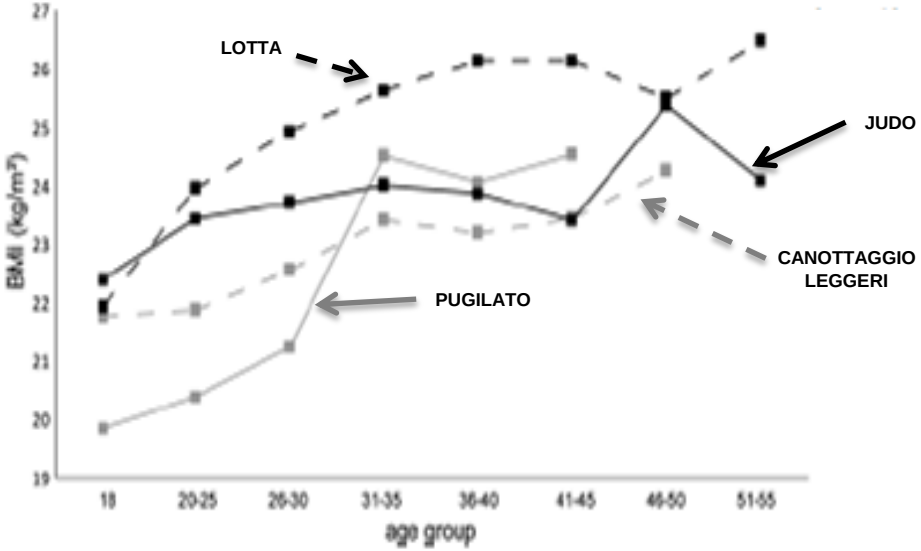
BMC Public Health

RESEARCH ARTICLE Open Access

No effect of weight cycling on the post-career BMI of weight class elite athletes

Laurie-anne Marquet[1*], Morgan Brown[1,2], Muriel Tafflet[1,3], Hala Nassif[1,2], Rémy Mouraby[1,2], Samir Bourhaleb[2], Jean-François Toussaint[1,4] and François-Denis Desgorces[1,2]





Condusion

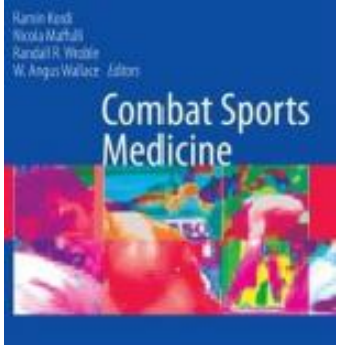
The present study shows that there is no particular effect of weight cycling on post-career BMI of retired elite athletes, independently of diets undertaken during their career. Similar patterns of BMI changes were observed in retired athletes and in the general population. The high level of physical activity of retired athletes could explain this lack of repeated diets effects on body mass evolution after retirement.

STRATEGIE per il RECUPERO del PESO

Vi è scarsa letteratura scientifica sui metodi di recupero del peso tra la misura ufficiale del peso e la gara stessa.
Metodi «aneddotici» includono assunzione orale di liquidi (di solito contenenti elettroliti e carboidrati), l'ingestione orale di cibo (di solito ad alto contenuto di carboidrati e liquidi per via endovenosa.

Se vi è sufficiente tempo di recupero (almeno 4-6 ore o più) dopo una perdita di peso del 2-5%, assumendo bevande a base di carboidrati (*8-10g CHO/kg p.c. al giorno*) e proteine (*0.2-0.5g PRO/kg p.c. al giorno*), pari al 125-150% del liquido perso durante la perdita di peso rapida, è possibile massimizzare il recupero dei liquidi e dei livelli plasmatici, e il ripristino del glicogeno muscolare, aiutando ad annullare o mitigare gli effetti negativi della disidratazione (e dell'apporto ipocalorico) sulla prestazione.

Weight Cycling: Prevalence, Strategies, and Effects on Combat Athletes - G. Joshua - Strength & Conditioning Journal October 2015



Ramin Kordi • Nicola Maffulli
Randall R. Wroble • W. Angus Wallace
Editors

Combat Sports Medicine

Recommended approach to weight control and preparation for optimal performance at a lean weight

Phase of season	Objective	Approach	Specifics
Preseason	Determine optimal weight class	• Assess body composition for lowest health weight • Strategic analysis for ideal weight class • Initiate program to change body weight • Refine technique for chosen weight class • Basic conditioning to reduce fat	• Aerobic conditioning • Resistance training for strength development and maintain muscle mass • Reduce intake of dietary fat and energy to reduce body fat
In season	Maintain weight close to weight class and train specifically for sport	• Increase energy intake and nutrients to maintain new weight and training • Sport-specific training to optimize conditioning • Refine technique, correcting errors in competition	• Primarily directed by the coach • Athletes should maintain resistance training to prevent strength loss • Ingest adequate amounts of carbohydrate, protein, and micronutrients

Table 2.4 Recommended approach to weight control and preparation for optimal performance at a lean weight

Phase of season	Objective	Approach	Specifics
Postseason	Minimize fat gain when season ends	• Initiate resistance training • Maintenance aerobic conditioning via combat sport or other sport • Evaluate goals versus outcomes of the past season	• Avoid excessive dietary fat • Compete in postseason competition • Set goals for increasing strength • Evaluate technical strengths and weaknesses • Aerobic conditioning 2–3×/week
Off-season	Stay lean and gain muscle	• Maintain intensive resistance training • Develop new techniques	• Attend camps, try new workout partners, and clubs • Resistance training 4–5×/week