DOI: 10.12957/demetra.2017.22327

# Considerations about the behavior of judo and jiu-jitsu competitors for fast weight loss before competition

## Considerações sobre o comportamento de competidores de judô e jiu-jitsu para rápida perda de peso pré-competição

Camila Kelly de Sena Souza[1]
Edeli Simioni de Abreu[1]

[1] Universidade Presbiteriana Mackenzie, Curso de Nutrição. São Paulo-SP, Brasil.

Correspondence
Edeli Simioni de Abreu
E-mail: edelisabreu@gmail.com

## Abstract

Judo and jiu-jitsu are two types of martial art whose techniques are based on self-defense and have a specific moral code. In martial art modalities, competitors are classified according to age and weight, in addition to technical grades of the modality being practiced. Because of this ranking, it can be often seen that there are competitors who seek to manipulate these variables. The maneuver most frequently used and cited by athletes is body weight reduction in periods preceding championships so that they can fight shorter and lighter opponents. This study aimed to investigate weight loss methods used by judo and jiu-jitsu competitors and their discourse to justify their conduct. Study participants were males of various degrees of judo and jiu-jitsu. Data were collected using a questionnaire with specific open- and closed-ended questions on eating habits, training and competitions, as well as anthropometric measurements. The sample consisted of six jiu-jitsu athletes and four judokas, with a mean age of 23.1 years, and all in full time training for more than 12 months. Only one athlete reported that he was not familiar whatsoever with techniques for rapid weight loss; five declared they performed some type of maneuver to manipulate their weight and four athletes replied that they were familiar with the methods only. According to the comments that exemplified the opinions of the athletes about such practices, the "Collective subject discourse" was compiled, which resulted in two aspects: one in favor of the maneuver (judo) and another with reservations (jiu-jitsu). Methods for rapid weight loss used by athletes today have been a regular practice for decades and their deleterious effects are mentioned in the literature. In general, athletes have

knowledge of the negative effects of these practices, but they do not break the habit.

**Keywords:** Body Weight. Weight Loss. Martial Arts.

## Resumo

O judô e o jiu-jitsu são modalidades de luta que têm base em técnicas de defesa pessoal e possuem código moral específico. Nas modalidades de combate, os competidores são classificados levando-se em consideração a idade e o peso, além da graduação técnica dentre a modalidade praticada. Em virtude dessa classificação, comumente percebe-se competidores que buscam manipular essas variáveis. A manobra mais utilizada e mais citada pelos atletas é a redução do peso corporal em períodos que antecedem os campeonatos, a fim de enfrentar adversários menores e mais leves. Neste trabalho, objetivou-se investigar os métodos para perda de peso usados por competidores de judô e jiu-jitsu e o discurso para justificar a conduta. Participaram do estudo competidores do sexo masculino, de diversas graduações de judô e jiu-jitsu. As informações foram coletadas com aplicação de um questionário com perguntas específicas abertas e fechadas sobre alimentação, treino e competições, além de sobre medidas antropométricas. A amostra foi composta por seis atletas do jiu-jitsu e quatro judocas, com idade média de 23,1 anos e todos com tempo total de treino superior a 12 meses. Apenas um atleta afirmou não ter familiaridade com quaisquer técnicas para rápida perda de peso; cinco declararam realizar alguma manobra para manipulação do peso e quatro atletas disseram que apenas conheciam os métodos. De acordo com os comentários que expunham as opiniões dos indivíduos sobre tais práticas, foi construído o "Discurso do sujeito coletivo", o que resultou em duas vertentes: uma a favor da manobra (judô), e outra com ressalvas (jiu-jitsu). Pode-se concluir que os métodos para rápida perda de peso usados por atletas atualmente são praticados há décadas e seus efeitos deletérios são mencionados na literatura. Os atletas conhecem, de modo geral, os efeitos negativos dessas práticas, mas não interrompem tal hábito.

**Palavras-chave:** Peso Corporal. Perda de Peso. Artes Marciais.

## Introduction

Martial arts have been widely disseminated and practiced by various sectors of society, often associated with a lifestyle and guided by certain cultural values.[1]

Judo is a martial art that derives from jiu-jitsu, which is a form of defense and attack practices and uses only the body to defend against, and/or attack the opponent. Master Jigoro Kano was responsible for selecting and classifying the best jiu-jitsu techniques, giving origin to a new modality, judo, or "gentle way".[2]

Jiu-jitsu, or soft art, is a martial art that had its origin in Indian monasteries and gained momentum in Japan, being practiced by noblemen and samurais. The basic principle of jiu-jitsu consists in using the minimum physical force and making use of the opponent's strength and weakness. In this modality, levers, pendulum sweep, joints lock, throws and strangles are used to dominate the opponent.[3]

Both modalities are characterized and taught for sporting purposes and must comply with the specific norms of fighting sports. The athletes' categorization exists in order to ensure homogenization between disputes and are defined according to the age, body weight and grades of the modality practiced. The athletes are classified according to the following criteria: sex, age, grade (belt color) and weight. Both modalities consider similar age, grading system and weight patterns.

Because of this classification, many competitors often attempt to change these variables – athletes that change age or compete at a lower grading level than that to which they actually belong, but the maneuver most frequently used and cited in the scientific literature is body weight loss in periods prior to the beginning of championships in order to fight with smaller and lighter opponents. Massive weight loss in a short period of time may be harmful to any individual, and for athletes it may cause many losses, such as decline in muscle strength, performance impairment, fall in plasma volume, reduction in myocardial efficiency, decrease of maximal oxygen intake, loss in thermoregulation mechanisms, reduction in glomerular filtration rate, depletion of glycogen stores, and excessive loss of electrolytes.[4-6]

Studies discussing weight loss by judo and jiu-jitsu competitors are predominantly quantitative, but collective-relating issues can be explored more appropriately by qualitative methods, which allow to express the individuals' perceptions on the subject matter.[7] Competitors represent specific social groups, with their beliefs, values and meanings.[8]

The Discourse of the Collective Subject (DCS) is a method for compiling and assorting qualitative data, developed by Lefevre & Lefevre[9] in the late 1990s, and is founded on the Social Representation theory. DCS is a synthesis-discourse developed with parts of discourses of similar meaning by means of systematic and standardized procedures.[10]

In scientific publications in the health area, there are still few analyses using qualitative methods and little accessible to readers. Thus, the present study aims to investigate the methods used by judo and jiu-jitsu competitors to lose weight and their discourse to justify this behavior.

## Methodology

This is a descriptive exploratory study with cross-sectional design and quantitative and qualitative approach, based on primary data collected from judo and jiu-jitsu competitors. Criteria of eligibility for the study included only male individuals, 16 years old as minimum age, and diverse belt grades – white, blue and purple belts for jiu-jitsu competitors; yellow, brown and black belts for judo competitors – who had participated in one or more championships of the modality and had at least twelve months of training in the respective modality. Non-eligible for this work were athletes belonging to heavyweight and super heavyweight categories for jiu-jitsu and heavy and super heavyweight for judo.

Data was collected in 2015 through a questionnaire developed by the researcher of this study, once there is no standard model for such assessment. Participants were interviewed and assessed at the place of meeting, their respective training sites. The questionnaire comprised open- and closed-ended questions on diet, training and competitions. Personal data of participants were also collected.

Information on current weight and habitual weight and height were self-reported.

For assessment of body composition, measures of triceps, subscapular, and chest skinfold thicknesses (TST, SST, CST) were used.

To measure the skinfold thicknesses, we used a clinical caliper (Sanny©) with 9.8 g/mm$^2$ constant pressure. The measures were collected twice, all of them at the right side of the athletes' body, without considering if they were right- or left-handed.

When interviewed, the empirical research framework was considered, i.e., thought, translated into discourse, where a qualitative variable is a product to be qualified later. However, this collective thought also becomes a quantitative variable since it expresses opinions shared by individuals.[11]

The questions were strategically built so that the individuals' responses would represent the best possible access to the social representations.[12] Each discourse was observed, taking note of what was important to the work, taking into account experiences in competitions, facts occurred with other athletes and other relevant facts. Everything was used as information for the study. According to the comments that showed the individuals' opinions on such practices, the Discourse of the Collective Subject (DCS), a proposal developed by Lefevre and Lefevre[9], was used.

The information was grouped according to the central idea, i.e., whether they were against or in favor of pre-competition weight loss maneuvers in each group, judo and jiu-jitsu. The opinions shared by the individuals were presented in the first person singular, in only one synthesis discourse, to illustrate how these social representations worked.

The collected data were tabulated using Microsoft® Excel 2011.

The athletes were classified considering the main modality (judo or jiu-jitsu), weight category, age and belt grade.

Body adiposity was estimated according to the sum of the TST, SST and CST skinfold thicknesses. [13]

The quantitative information was analyzed by descriptive statistics.

The work was conducted in compliance with all directives of Resolution no. 466/2012, which deals with Ethics Research with Human Beings. All individuals who agreed to attend the survey, or their legal representatives, in case of minors, signed the Free and Informed Consent Term.

The research is registered under the umbrella project no. CAAE 50307715.7.0000.0084/2015, approved by the Research Ethics Committee of the Universidade Presbiteriana Mackenzie.

## Results

Data on 11 (eleven) athletes were collected, and one of them was disregarded according to the weight category classification.

The study sample comprised 10 (ten) athletes, six of jiu-jitsu and four of judo. All participants were male, with age ranging from 16 (sixteen) to 36 (thirty-six) years old, mean age 23.1 years.

With regards to the competitors' age classification only two individuals fell into the juvenile category (JJ-2 and JJ-4). The others fell into the adult or master category, and practiced the sport for fifteen years or more, except for two white-belt competitors of jiu-jitsu (JJ-5 and JJ-6), who had three years and one year of practice, respectively, the first (JJ-5) with seven years of practice in judo and a purple belt grade. The J-4 individual answered in the questionnaire that he had already competed when was a child, but quitted the sport and returned to the trainings a little more than one year ago.

Table 1 shows the athletes' characterization data.

**Table 1.** Characteristics of the individuals enrolled in the survey. São Paulo, 2015.

| Athlete | Belt Grade | Age | Training time | % body fat | BMI | Category |
|---|---|---|---|---|---|---|
| J-1 | Black | 23 | 16 years | 15.4 | 27.1 | Medium |
| J-2 | Brown | 23 | 16 years | 7.8 | 23.1 | Half light |
| J-3 | Brown | 22 | 14 years | 8.6 | 24.5 | Light |
| J-4 | Yellow | 21 | 1-9 months | 13.7 | 21 | Medium-light |
| JJ-1 | Purple IV | 36 | 15 years | 11.5 | 26.9 | Medium |
| JJ-2 | Blue II | 17 | 4-6 months | 8.6 | 20.2 | Feather |
| JJ-3 | Blue I | 32 | 1-9 months | 6.9 | 23.9 | Light |
| JJ-4 | Blue | 16 | 1-8 months | 8.6 | 20.1 | Feather |
| JJ-5 | White IV | 19 | 3 years | 5.9 | 22.5 | Light |
| JJ-6 | White II | 22 | 1 year | 22 | 29 | Medium-heavy |

Legend: JJ = jiu-jitsu athletes; J = judo athletes

Of the athletes that comprised the sample, three were overweight, according to the BMI, and the nutritional status of eight of them indicated normal weight, and the average BMI was 23.8. Regarding the percentage of body fat (BF), the values found varied from below the average to average and above the average. Considering the values recommended by Lohman,[14] there was no athlete with BF risk values. They had an average BF of 10.9%

The athletes' BF percentage classification is shown in Table 2.

**Table 2.** Classification of the body fat percentage of the individuals participating in survey. São Paulo, 2015.

| Classification | % Body fat | No. of competitors |
|---|---|---|
| High risk[1] | ≥ 25% | 0 |
| Above average | 17 – 24% | 1 |
| Average | 14,5 – 16% | 1 |
| Below average | 6 – 14% | 8 |
| High risk [2] | ≤ 5% | 0 |

Source: Lohman.[13]

Legend: [1] = high risk for obesity-associated diseases and disorders. [2] = high risk for malnutrition-association diseases and disorders.

All participants reported that they had a total training time of more than one year. In the total training time, the periods when the trainings were interrupted by any reason, were not disregarded.

For the judo athletes, the grading was directly proportional to the total training time, i.e., the longer the athlete' sporting life, the higher his grade was. Regarding the jiu-jitsu athletes, the total training time did not influence completely the sample, because there were athletes with less training time compared to others and were higher in the classification structure.

Of the total sample, four athletes mentioned that they practiced other sport modality, namely: bodybuilding, other combat modality and functional aerobic trainings. The athletes justified it by saying that the additional workouts improved their performance in the main sport modality and were also a hobby.

Of the entire sample, only one judoka reported not being familiar with the fast weight loss methods cited in the questionnaire.

When asked about the need to lose weight before a fight, five athletes reported that they already needed to lose weight before a competition and, of these, four athletes said that they had already resorted to the fast weight loss practices mentioned in the questions form.

The methods that the athletes used to lose weight are described in the chart below (Chart 1).

**Chart 1.** Weight loss methods cited by the athletes. São Paulo, 2015.

| FAST WEIGHT LOSS METHODS | | | | |
|---|---|---|---|---|
| Wearing plastic clothes/ sport sweats/others | < food intake | < liquid intake | > time of aerobic workout | Sauna |
| Cited 3 times | Cited 4 times | Cited 3 times | Cited 4 times | Cited 3 times |

The athletes who reported having resorted to maneuvers to lose weight before a competition were asked to inform who was responsible for the guidance/suggestion of the adopted methods, and the responses were: "other athletes (training peers)" and "the methods used were chosen by themselves".

In the case of championships and the need to lose weight in the pre-competition period, three jiu-jitsu athletes and one judo athlete stated that they compete in the weight category corresponding to their current/habitual weight. But they also said that this practice was very common in the teams, although considered it harmful. When they were asked about their opinion about fast weight loss prior to a fight, the discourses were always related to immediate performance.

At the same time that the negative points of the practices cited in the questionnaire were reported, the athletes considered them normal or usual, either because many of them made use of these maneuvers or they had learned through the media that prime athletes also practiced them.

During the interviews, the athletes' comments on this subject were recorded in writing.

Chart 2 describes the athletes' discourses on the weight loss methods, according to the Discourse of the Collective Subject.[9]

**Chart 2**. Discourse synthesis of athletes on methods to lose weight. São Paulo, 2015 (our translation)

| JIU-JITSU ATHLETES | JUDO ATHLETES |
|---|---|
| • Discourse against maneuvers<br>"When we diminish foods intake we are deprived of the nutrients that give us strength and fuel for a fight. Dehydrating is not losing weight." "Dehydrating is not losing weight. The guy only loses weight, right?" "I consider it harmful because it diminishes the athlete's strength and performance. Either fasting for a long time or dehydrating too much can spoil a championship day because we have at least five fights in a same day."<br><br>• Discourse justifying maneuvers<br>"Well, it is not good, but I don't think it causes big damages because it does not last too long." "Dehydrating can diminish yield, but this is normal, everyone does it." "There are things that are unhealthy, such as eating less. There are also those that can be harmful, like dehydrating too much, which may cause a drop in performance, but in tournaments we always see someone running because he still needs to cut weight." | • Discourse for maneuvers<br>"Everybody does it, its normal." And "there are things that we can do which are healthful, and others are harmful." These "are harmful methods, but I always need to lose weight before a fight and have to do something about it." And "on days of competition, it is normal to see people running around the mat, for example"; even considering it "harmful, but its normal to do it." And "I have already done everything that is here (choices in the form); it can be harmful, but it is normal." |

Of the total subjects of the sample, only one said having had contact with a nutrition professional. This same athlete stated having never used none of the weight loss methods mentioned in the questionnaire used for this study.

All jiu-jitsu subjects belonged to the same team and were trained by the same coach and same master. The judokas did some training together but belonged to different teams.

## Discussion

The criteria for classification of athletes of fight modalities include technical level (grading/belt), age and body weight. About age, it is very common that the practice starts in childhood or adolescence. In this study, only two individuals belonged to the juvenile category (up to 17 years old), but considering the total training time of the athletes that belong today to the adult and master categories, it can be seen that almost all started in childhood or adolescence. Athletes who still are in the phase of childhood or adolescence should be assigned to a special group of attention. It is known that during these important phases of human growth and development, there is a specific nutritional demand which, if not met, may cause damages with long-term effects. In addition to the strains that these individuals may suffer because of the sport, it should be taken into account the existence of diverse factors that interfere with an adequate diet.[15]

The two juvenile athletes that participated in this study, even knowing the maneuvers, reported having never used them to lose weight. However, in study conducted by Almeida et al.[16] about hydration habits of 36 Brazilian adolescent judokas, half of them reported having needed to lose weight before a tournament. For this purpose, 48% of them increased the level of workouts, 36% did some kind of food restriction, 8% reduced liquid intake and 8% wore special clothing to train. The methods used by the judo adolescents are the same ones described by this study and by the majority of those cited herein, confirming how common these methods are.

More important than total body weight, the body composition should be assessed and taken into account in the athletes' classification. Reports of athletes who died because of deleterious practices to lose weight are known and pointed out not only in scientific papers but in popular magazines and other media. [17,18] The classical model of body composition divides the body into two parts: one consisting of body fat, and the other tissues are grouped and called lean body mass or fat-free body mass. Although the values vary, all participants exhibited Lohman's ideal percentage of body fat.[13] Taking into account such classification, eight athletes had below-average percentage of body fat (between 6% and 14%). Very low values of this component can indicate high risk of malnutrition-associated diseases and disorders. Lipids are essential to the human body as they are key in the performance of basic functions such as cell membranes formation, energy production, transport and storage of liposoluble vitamins (A, D, E and K), in the proper

functioning of the nervous system and the reproductive system, and in the production of steroid hormones. Although it is not a rule of thumb, individuals with a low percentage of body fat often have eating disorders.[19]

In order to fit in disputes that may give them some advantage, the athletes sometimes try to change the variables that classify them, and the main tactics involves sharp changes in the body weight.[20] This second point and its physiological effects are the main motivators for carrying out this study.

According to the literature review conducted by Hirschbruch & Carvalho,[20] the methods most commonly practiced by athletes to cut weight are less intake of liquids and foods, intense workouts wearing plastic or rubberized clothing and dry or wet sauna. These practices may start weeks before a combat, but it is known that they are practiced up to a few hours before weighing.

This information corroborates the discourse of some athletes of this study, who went on to report the following: "(…) in championships we always see people running because they still need to lose weight" and "on the day of fight, it is common to see people who need to cut weight running around the mats, for example." During the interviews, even the athletes who stated that they have never used any tactics to lose weight before a competition commented that these practices are normal, i.e., common, and the athletes of this modality are used to them.

The competitors' discourse allows to confirm that the athletes seek ways to cut weight in a very short period of time, even at the day of competition. Losing weight in less than a week is the most dangerous tactics, since the weight lost in this period is basically water loss, which represents danger to the body because it interferes with the thermoregulation mechanisms and in the sweating capacity, which impairs the athlete's strength and resistance.[21]

It is known that there are several methods to lose weight that can be used by these athletes. These strategies can be classified into three groups: fast weight reduction, gradual weight reduction, and those considered pathogenic methods.[20]

The practices that appear more often in studies already published served as the basis for the construction of the questionnaire. In addition to the methods most commonly found among athletes, it is also possible to cite other findings that can be classified as pathogenic methods. These methods also result in weight loss in a short period of time but are totally reprehensible, because they may be harmful to the athlete physically and mentally.[20,22]

There were no reports on the use of laxatives, diuretics, appetite moderators, or vomit induction by the competitors. These methods are considered pathogenic because of their negative effects on the athlete's performance caused by physical and/or mental alterations, and can also induce eating disorders such as anorexia and bulimia, particularly in the most predisposed public, that of female athletes.[20]

Although occurrence of eating disorders predominates in female athletes, they are also found among males, and are equally of great concern. Cases of eating disorders, especially bulimia, in male athletes occur mainly in sport modalities where weight control is very strict and overvalued.[23] In a study that investigated eating habits and distorted self-image in 101 judo athletes, eating disorders were found in 30.7% of the sample, 41.9% of them comprising male athletes.[24]

In a study that aimed to investigate methods for fast weight loss used by jiu-jitsu fighters, the individuals reported making use of diverse artifacts, among them diuretics (18.1%), laxatives (9%), weight loss drugs (9%), and vomiting (4.5%). Pathogenic methods, when compared to those of rapid weight reduction, are unusual, but still put into practice.[25] According to the International Olympic Committee (IOC) and the World Anti-Doping Agency, the use of diuretics is considered as doping and a violation of ethical and disciplinary codes and may be subject to strict punishments for both athletes and their respective technical commissions. [26]

In addition to penalties, the use of diuretic drugs may trigger hypokalemia in the athlete, or a drop of potassium levels in blood. This alteration may interfere with the functioning of the sodium-potassium pump mechanism, affecting the difference of electrical charge that must be maintained between the intra- and extra-cellular medium. Such alteration causes osmotic imbalance and damages the activity of the muscular and nervous cells that depend on this mechanism to enable the uptake of amino acids and sugars.[27]

In the study sample, nine athletes said that they were familiar with the techniques but never practiced them; half of the sample athletes stated having already needed to lose weight before a competition, and four of them reported having used some method to lose weight rapidly. To justify their opinion on the methods to lose weight cited in the questionnaire, the jiu-jitsu athletes expressed negative ideas and disapproval of these practices. On the other hand, the judo athletes were also aware of the harmful effects of these methods, but claimed that they were normal (in the data analysis, the response "normal" was construed as "common", "usual"). In addition, they cited as source of guidance other athletes/other competitors – they were not asked whether these athletes belonged or not to the same team.

Social representations are social cognitive mechanisms that people use to express opinions or judgements in their daily lives. These results show that a survey using DCS may generate a collective panel of opinions, where a same opinion acquires distinct nuances, since it is produced by distinct social actors (in this case, judo athletes assuming a position in favor of the maneuvers and jiu-jitsu athletes justifying their use); that the qualitative results (discourses) and the quantitative results can articulate with one another.[12]

As Lefevre, Lefevre & Marques discuss[11]

> The most significant presence of empirical material, associated with the understanding of the collective thought as referent, allows a dialogue of the descriptive moment with the interpretative moment in this kind of research, and can, as a new possibility pointing out to the uncertain and unexpected, contribute to a renewed understanding of the nature and functioning of social representations as complex realities. (Our translation).

It is suggested that the similar idea of the athletes, whether positive or negative, is due to the influence of the team master, who is responsible for enhancing the athletes' strengths and weaknesses and demanding changes in the most diverse aspects of their lives, especially in periods of competition. Within the team, in addition to leading the students and assisting in their continuous technical improvement, teachers act as mirror for the students and have the responsibility of always getting the best from each athlete that approaches them.

In a study about practices to reduce weight in judokas,[5] the participants were asked about their main source of guidance for manipulation of the body mass. The main persons responsible for such guidance were the coach (78%) and trainer (57%), followed by magazines (40%) and friends (37%). Based on the results found in this work, we noticed the important influence that the team master has on the athletes, not only in judo and jiu-jitsu, but in other martial arts too.

In a study conducted with shotokan karate athletes, a sport modality that does not require classification by weight did not identify any practices aiming to reduce weight nor the use of ergogenic substances or drugs that might have an influence on the athlete's performance. The authors suggested that this is because of the philosophy, the principles of this modality, which stimulates body and mind control, which is the athletes' greatest challenge.[20,28]

The jiu-jitsu philosophy goes far beyond the practice of techniques, discipline and equilibrium. Briefly stating, the adoption of good eating habits, body care, keeping away from alcohol and other drugs and close to the family and friends are attitudes that must be taught by teachers and practiced by students. These behaviors not only have an effect on the athletes' performance but in their lives in general.[29]

## Conclusions

In order that the collective thought could be self-expressed through this empirical research, it was necessary to constitute a subject that would carry the collective discourse: a collective subject. Thus, by analyzing the DCS, it could be found that the familiarity with methods to lose weight fast is almost unanimous among judo and jiu-jitsu competitors, but actually practicing these methods

was not so frequent in the individuals of this study. The most cited maneuvers used to lose weight fast were those that reduce body hydration by sweating and less water intake, in addition to calories reduction in diet.

The athletes' body composition indicated that most of the individuals had a percentage of body fat below the average, which was already expected, since it was a study with individuals with very frequent and intensive physical activity.

Nutritional intervention in athletes is vital and so they can be properly instructed on the most appropriate ways to keep the ideal weight, since this variable is determinant in competitions. Furthermore, coaches must also be oriented because they are those with the greatest influence on these individuals' sportive behavior.

Although they are aware that these practices are harmful, such maneuvers are still widely used, which is due to lack of instruction and knowledge on the long-term damages that these methods cause to health and on proper ways to control body weight.

## Collaborators

Souza, CKS and Abreu, ES participated in all stages, from the study conception to the final review of the paper.

Conflict of interests: The authors declare that there is no conflict of interests whatsoever.

## References

1. Gonçalves AVL, Santos da Silva MR. Artes marciais e lutas: uma análise da produção de saberes no campo discursivo da educação física brasileira. Rev Bras Ciênc Esporte 2013; 35:657-71.
2. Embaixada do Japão no Brasil. Da antiga tradição aos esportes modernos. Revista Nippon e Niponic 2012. [acesso em: 13 jan. 2016]. Disponível em: http://www.br.emb-japan.go.jp/cultura/artesmarciais.html
3. Virgílio S. Conde Koma: o invencível yondan da história. Campinas: Átomo; 2002.
4. Artioli GG, Scagliusi FB, Polacow VO, Gualano B, Lancha Junior AH. Magnitude e métodos de perda rápida de peso em judocas de elite. Rev Nutr. 2007; 20(3):307-15.
5. Fabrini SP, Brito CJ, Mendes EL, Sabarense CM, Marins JCB, Franchini E. Práticas de redução de massa corporal em judocas nos períodos pré-competitivos. Rev Bras Educ Fís Esporte 2010; 24(2):165-77.
6. Hall C, Lane A. Effects of rapid weight loss on mood and performance among amateur boxers. Br J Sports Med. 2001; 35:390-5.

7. Rocha EM, Alves M. Metodologia qualitativa. In: Bicas HEA, Rodrigues MLV, editores. Metodologia científica. Rio de Janeiro: Cultura Médica; 2008. p. 337-40.

8. Minayo MCS. O Desafio do conhecimento. Pesquisa qualitativa em saúde. 8ª ed. São Paulo: Hucitec; 2004.

9. Lefevre F, Lefevre AMC. O discurso do sujeito coletivo: um enfoque em pesquisa qualitativa (Desdobramentos). Caxias do Sul: EDUSCS; 2003.

10. Lefevre F, Lefevre AMC. Pesquisa qualitativa levada a sério [Internet]. São Paulo: USP; 2003. [acesso em: set. 2016]. Disponível em: http://www.fsp.usp. br/~flefevre/Discurso_o_que_e.htm

11. Lefevre F, Lefevre AMC, Marques MCC. Discurso do sujeito coletivo, complexidade e auto-organização. Ciênc Saúde Coletiva 2009; 14(4):1193-1204.

12. Lefevre F, Lefevre AMC. Pesquisa de representação social. Brasília: Liberlivro; 2010.

13. Jackson AS, Pollock ML. Generalized equations for predicting body density of men. Br J Nutr. 1978; 40:497-504.

14. Lohman TG. Advances in body composition assessment Champaign, IL: Human Kinetics Publishers; 1992.

15. Perron M, Endres J. Knowledge, attitudes, and dietary practices of female athletes. J Am Diet Assoc. 1985; 85:573-76.

16. Almeida EC, Cavalieri MC, Hirschbruch MD, Pádua Cintra I, Fisberg M. Hábitos de hidratação em adolescentes praticantes de judô. Pediatr Mod. 2005; 41(6):291-300.

17. Ransone J, Hughes B. Body-weight fluctuation in collegiate wrestlers: implications of the National Collegiate Athletic Association Weight-Certification Program. J Athl Train. 2004; 39:162-5.

18. Correia D. Atletas do UFC perdem até 16 kg para 'enganar' a balança. Veja [Internet]. 8 ago. 2011. [acesso em: 13 jan. 2016]. Disponível em: http://veja.abril.com.br/noticia/esporte/lutadores-do-ufc-perdem-ate-16-kgs-para-enganar-a-balanca

19. Cezar C. Alguns aspectos básicos para uma proposta de taxionomia no estudo da composição corporal, com pressupostos em cineantropometria. Rev Bras Med Esporte 2000; 6(5):188-93.

20. Hirschbruch MD, Carcalho JR. Nutrição esportiva: uma visão prática. São Paulo: Manole; 2002.

21. Quintão DF. Estratégias rápidas para perda ponderal, composição da refeição pré-treino e nível de desidratação em atletas de jiu-jitsu de Ipatinga-MG. Rev Brasil Nutr Esportiva 2013; 7(41):269-78.

22. Foss ML, Keteyian SJ. Bases fisiológicas do exercício e do esporte. 6ª ed. Rio de Janeiro: Guanabara Koogan; 2000.

23. Mellin P, Araújo AM. Transtornos alimentares em homens: um desafio diagnóstico. Rev Bras Psiquiatr. 2002; 24(Supl. III):73-6.

24. Vieira J, Oliveira L, Vieira L, Vissoci J, Hoshino E, Fernandes S. Distúrbios de atitudes alimentares e sua relação com a distorção da auto-imagem corporal em atletas de judô do Estado do Paraná. R Educação Física/UEM 2006; 17(2):177-184.

25. Ribas MR, Stainsack JM, Shuluga Filho J, Tambui PB, Zyla AL, Zonatto H A, et al. Técnicas bruscas para perda de peso em lutadores de Jiu-Jitsu. Revista UNIANDRADE 2015; 16(1):15-21.

26. Carvalho T, Rodrigues T, Meyer F, Lancha Jr AH, Rose EH. Modificações dietéticas, reposição hídrica, suplementos alimentares e drogas: comprovação de ação ergogênica e potenciais riscos para a saúde. Rev Bras Med Esporte 2003; 9:43-56.

27. Amabis JM, Martho GR. Fundamentos da biologia moderna. 3ª ed. São Paulo: Moderna; 2003.

28. Rossi L, Figueira RT, Fabri A, Segli J, Tirapegui J. Avaliação antropométrica e das razões para prática de artes marciais. Rev Nutr Brasil 2007; 6(2):100-4.

29. Código de conduta dos instrutores [Internet]. Gracie Barra [acesso em: 13 jan. 2016]. Disponível em: http://www.graciebarra.com/br/codigo-de-conduta/

Received: April 04, 2016
Reviewed: September 21, 2016
Accepted: November 1st , 2016