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PERCEPTIONS AND MOTIVATION OF TOP-LEVEL JUDOKAS FROM CÔTE D'IVOIRE ABOUT PRACTICE OF RAPID WEIGHT LOSS

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ABSTRACT

This study determined the perceptions, the motivation, and the different methods of rapid weight loss (RWL) and its consequences concerning elite judokas in Côte d'Ivoire. Twelve judokas finalists from the 2018 National Championship, including two women, participated in this study conducted as a series of semi-structured individual interviews. Judokas' perception of RWL, motivation for its use and actual practices in terms of frequencies and techniques were investigated. More than two-thirds of the participants (70%) believe that RWL does not have any consequences on health. They achieve their weight loss by combining several techniques (food deprivation, plastic sun drills, additional training and use of laxatives). They performed RWL for less than a week at a frequency of 3 to 4 times a year. The main reasons for employing this practice are the desire to win, the fear of opponents and encouragement from coaches. This survey revealed that judokas in Côte d'Ivoire are not well aware of the consequences of RWL, but that they practise it frequently. There is a need to raise awareness and also to inform judokas about the potential risks of this practice.

Keywords: Competition; Dehydration; Food deprivation; Judo; Rapid weight loss (RWL).

INTRODUCTION

In combat sports, weight categories ensure equal opportunity for athletes (Artioli *et al*., 2010a), while allowing those who have substantially the same weight to fight each other (Xiong *et al*., 2017). It has been reported that some judokas practice rapid weight loss before weight-in, in order to be qualified in a lower weight category (Fortes *et al*., 2017). In fact, a few days before competition they attempt rapid weight loss to change their weight category, because they think they are taking advantage of this practice (Dubnov-Raz *et al*., 2015; Durguerian *et al*., 2015). Rapid weight loss (RWL) is the voluntary loss of weight a few days before the competition (Artioli *et al*., 2010a), sometimes with very aggressive methods that have immediate effects (Reale *et al*., 2017). This practice can compromise performance and affect the health of athletes (Sundgot-Borgen & Garthe, 2011). Surveys in Europe and Brazil have shown that athletes

generally start this practice in their teen years at 12 −13 years of age, reducing their weight by an average of more than 5% (Artioli *et al*., 2010a; Reale, 2018).

The main techniques of RWL, reported in the literature, range from dietary restriction to voluntary total food deprivation (Legan-Evans *et al*., 2011) and include reduction of water intake, total water deprivation, using of sauna, laxatives and diuretics (Alderman *et al*., 2004; Roerig *et al*., 2010), and using of plastic suits, as well as increasing training load with the use of plastic suits (Franchini *et al*., 2012; Dubnov-Raz *et al*., 2015). The risks associated with RWL are mainly dehydration, which can disrupt thermoregulation and metabolism (Xiong *et al*., 2017), decreased energy reserves (Reale *et al*., 2017; Reale, 2018) and decreased physical capacity, which may increase the risk of injury.

In Côte d'Ivoire, judokas practice rapid weight loss. These athletes cannot escape the risks and poor performance associated with this practice reported in the literature (Xiong *et al*., 2017; Reale, 2018). The practice of RWL represents an additional risk in the hot and humid environment of Côte d'Ivoire, where the average temperature is approximately 30°C (Kouadio *et al*., 2016) with a humidity level often above 70%.

In North Africa, some authors have focused on the theme of rapid weight loss (Aloui, 2016; Tayeb, 2018). However, in sub-Saharan Africa, academic circles are still barely interested in this phenomenon. Consequently, in Côte d'Ivoire, studies focusing on the rapid voluntary weight loss of athletes are rare.

PURPOSE OF RESEARCH

The purpose of this study was to determine the perception of rapid voluntary weight loss and its consequences among elite judokas in Côte d'Ivoire.

METHODOLOGY

Research design

This cross-sectional study in the form of a survey was conducted through individual interviews during February and March of the 2018 sporting season at the National Institute of Youth and Sports (INJS, Abidjan, Côte d'Ivoire).

Participants

This research focused on the population of male and female judokas in the senior elite category in Côte d' Ivoire. A sample of 12 seniors, including 10 men and two women, were selected based on a purposive sampling strategy that was intended to include international level athletes. In this study, the athletes interviewed were those who participate in national competitions during which the weighing is done one hour before the competition, according to the rules of the Ivorian Judo Federation. One of the athletes selected competed in the Olympic Games, another was a Junior African Champion, four were bronze medallists at the Senior African Championship, and two others were silver and bronze medallists at the Games of La Francophonie.

These international-level athletes had considerable experience in high-level competitions and were residing in Côte d'Ivoire at the time of the survey. To be included in the sample, each judoka had to meet the following inclusion criteria: provide written informed consent, hold a sports license for the 2018 season and have been a participant in the 2018 National

Championship. Two elite athletes, who were under sanction by the Ivorian Judo Federation at the time of data collection, were not included in the study sample.

Ethical procedures

The study was performed in compliance with the Declaration of Helsinki and upon the prior consent of the ethical committee and the authorities of National Institute of Youth and Sports (INJS, Abidjan). The agreement of the Ivorian Judo Federation was obtained and all the participants gave written consent to the study.

Data collection tool

This study was conducted using a semi-structured interview guide that consisted of 28 questions including three main questions, 18 re-orientation questions and seven follow-up questions. Re-orientation and follow-up questions were not asked systematically. They were asked to those judokas whose responses departed from the essential concerns of the interview. The questions were divided into three main dimensions: (1) Perception of RWL and its consequences; (2) The reasons why judokas practise RWL; (3) The actual RWL practices of elite judokas in Côte d'Ivoire in terms of frequency and techniques used.

The sensitivity of the interview guide was assessed in a pre-test session with judokas who were not part of the study sample to revise questions that posed comprehension problems. The content of the interview guide was validated by an experienced researcher, who is well-known for his research in the humanities and social sciences.

Data collection protocol

A preliminary session was held to inform the judokas about the objectives and motivation for the study, the methods for conducting the interviews, and the measures taken to ensure the anonymity of the data collected. A commitment was made to destroy the interview recordings no later than 10 months after their use. The questions were translated into "nouchi" (informal French from Côte d'Ivoire) for judokas who did not understand French very well. The interviews were conducted at various sports clubs and training sites outside of training hours, according to a schedule agreed upon with the judokas and their coaches. Each judoka was interviewed only once by an investigator previously trained by the principal investigator.

Data processing

The information collected during the interviews was processed by content analysis (Bardin, 1977) in three phases: information condensation, coding, analysis and data interpretation. During the condensation phase, selected elements from the interviewees' responses that were relevant for the analysis were transcribed and the responses and opinions of each judoka in relation to the different axes selected for the study, were identified. Coding of the elements of the judokas' responses was carried out, according to the themes addressed, to generate a summary sheet according to dimension and sub-dimension. The analysis linked the information within the same axis or dimension in a dynamic of confrontation of ideas within the group and/or with the data in the literature.

RESULTS AND DISCUSSION

Characteristic of judokas

Twelve judokas were from the categories -60kg; -66kg; -73kg, -81kg, -90kg, -100kg, -63kg, -70kg. They are all black belt and represented 42.8% of the 28 elite judokas of the national team of Côte d'Ivoire.

Table 1. **CHARACTERISTICS OF SURVEYED JUDOKAS** (n=12)

Characteristics	Mean±SD
Age (years)	23.2±3.3
Seize (cm)	170.0±10.4
Usual body mass (kg)	73.2±11.4

Perception of RWL and consequences

Perception of RWL

These athletes from the Ivorian elite of judo believe that rapid weight loss is when *athletes who are above their usual weight category are forced to do activities to lose weight in order to fight in their category* as judoka E2 stated. Fighter E10 agreed, *it is when an athlete who is overweight in relation to a weight category decides to remove his excess kilograms to fight in a category below his weight*. In fact, Côte d'Ivoire elite judokas know that rapid weight loss, commonly referred to as 'diet', consists of losing body mass to fight in a weight category below one's usual training weight (Reale *et al*., 2017).

However, the judokas interviewed do not have the same perceptions of the duration of rapid weight loss, which consists of losing a few kilograms to belong to a specific category. For respondent E4, the duration of the RWL is two days. However, for participant E5, this period may be longer. This means that study participants do not have a clear perception of the physiological consequences of rapid voluntary weight loss.

RWL consists of changing weight category by voluntarily reducing body mass (Artioli *et al*., 2006; Artioli *et al*., 2016) to fight in a weight category that is below normal weight using aggressive weight loss methods (Reale *et al*., 2016a; Reale *et al*., 2017) in a relatively short time (1 to 2 weeks) before the competition (Artioli, 2010a). This practice is intensified within 48 hours before the official weigh-in (Artioli *et al*., 2016). The recorded responses clearly indicate that the judokas of the Ivorian elite have information about what RWL is, although they do not very clearly define typical durations for this practice and have no real information about its impact on the body.

Perception of the consequences of RWL

The use of techniques associated with this practice can have serious consequences on the body (Franchini *et al*., 2012; Reale *et al*., 2016a), and yet, some judokas of this study think that RWL has no major impact on health and performance. Respondent E12 stated that *you feel a little tired but [there is] no real danger*. This view was shared by the E3 athlete who stated that *the diet has not yet had an impact on my health*. Other athletes believe that RWL affects performance much more than health by inducing fatigue in the athlete, as evidenced by judoka

E2 who stated that *we are not at 100% of our abilities ... it is tiring, in general it is very exhausting*.

Participant E11 reported a problematic experience that highlights the effect of RWL on performance as follows:

> *The regime reduces strength. The abilities you have when you are not on a diet are reduced when you are on a diet. Once I lost 5kg, and at the competition, I was tetanised, I couldn't even catch the kimono, all my muscles were blocked. I was stuck, I had lost about 4kg in less than a week, and by the time I got to the competition I was dead exhausted. That day, at the first match, it went well, but at the second match, my muscles didn't respond anymore. I was gbolo (exhausted). So I lost. RWL, in other words, reduces performance*.

The observation is that many athletes are aware that RWL can reduce performance and physical abilities even if, for some, it has no effect on health. Some judokas of this study revealed that RWL can have health consequences. Respondent E1 stated that *this practice can be dangerous for health and performance. This practice.... can seriously threaten your health*.

Dehydration can cause disorders of the hormonal and the cardiovascular systems, a decrease in kidney function (Artioli *et al*., 2006), disruption of the thermoregulatory system (McDermott, 2017) and can have lethal consequences if it progresses. For example, in 1996 one judoka and three wrestlers died while attempting RWL (Franchini *et al*., 2012). The practice of RWL can present health risks, cause fatigue, heat exhaustion or even heat stroke and result in the athlete's death. This is why Artioli *et al*. (2016) suggested a ban on this practice.

Perception of the psychological impact of RWL

Psychologically, the practice of RWL puts the athlete under pressure, as evidenced by participant E11 who stated that *psychologically, we are stressed. We are under two types of pressure, that of competition in addition to the pressure of wanting to make our weight. Double pressure*. For others, this pressure translates into nervousness, as in the case of the athlete E10, who gave the following explanation: *When I finish a diet, I don't want anything at all. I'm... nervous*. Once the weigh-in is completed, the athletes feel relief, that of having made the weight and being able to recharge and hydrate without constraint.

The joy felt by judoka E3 was coupled with a motivation to obtain good results. He stated that *psychologically, we are already happy to be able to make our weight and we say to ourselves, if I have managed to make my weight, it is not the competition in itself that will prevent me from succeeding. It is a motivating factor*. RWL strengthens the mind and willingness of athletes to win. This observation is supported by the statement of fighter E7 that *RWL is also a factor in improving my physical capacities*. This competitor stated that *RWL provides greater motivation to fight, because I tell myself that I did not make all these efforts for nothing*.

These testimonies indicate that for many athletes, RWL provides an advantage over opponents. They embrace the vision of European athletes for whom fighting in lower weight categories is a definite advantage in terms of strength, muscle power and mobility. In this view, rapid weight reduction gives a psychological advantage, that of feeling like a ‘true athlete’ (Pettersson *et al*., 2013). Relative to their knowledge, the diversity of responses obtained from the athletes interviewed may reflect their low average intellectual level.

Reasons for practice of RWL

Reasons related to technical supervision

There are a number of reasons why athletes choose to practise RWL. It is mainly about the desire to obtain all advantages possible in order to achieve the best result. Personal reasons and those related to technical supervision were also mentioned. Some athletes simply feel good in a given weight category. They know their opponents well in these categories and their ways of fighting, and they think they have a better chance of success. Others are afraid to face opponents they consider too strong for them and they prefer to exit the category.

Another reason is the need to maintain a rank or ranking to benefit from the advantages of national team selection and to participate in travel to international competitions. Therefore, the athletes are ready to comply with the requirements of the technical support team or trainer, who may impose weight categories lower than their normal body weight. There is also the fact that after each season, rankings are established, and athletes are selected by weight category. To increase the chances of participating in international competitions, the athlete must remain in the weight category in which he or she has been selected. In this case, if body mass increases, the need for RWL is inevitable. For some coaches, having athletes fight in lower weight categories maximise their chances of success. Athletes are then forced to comply with the coaches' instructions.

Coaches do not hesitate to impose diets on athletes. The case of participant E11 reveals the influence of the technical staff in the following explanation:

> *In my case, for ten months now with my 84-85 kg, I have been fighting in the less than 90 kg category, so I am checking with the technical staff to see if I need to go down in the -81 kg group or go up in the upper category in -90 kg, especially for international competitions. Last I heard, I think I'm going to go down because with this weight, it's harder to be in the -90 kg category, because the guys in this category are physically very strong. I am going back to RWL*.

The words of fighter E8 summarise the reality experienced by the athletes and provide a better understanding of the various motives presented above.

> *I was doing RWL, to keep my place in my category. It's a category I liked and I was the national champion in the category. I'm not afraid of other athletes in the other categories, but there are already other athletes selected in the other categories, so if you change at each category competition, you can't get selected for international competitions. Often, coaches impose weight categories on us. If the coach selects you for the -66kg, you have to be the weight. In addition to other reasons, it is the fact that we lose our scholarship if we leave our weight category.* (Fighter E8)

Respondent E3 highlights the fear of stronger opponents whom he does not want to face. He explains that *there is also the fear of the opponent. For example, when I come across a top-class opponent like X (-100 kg), I tell myself that he is more powerful than me, and I can no longer do my judo*.

The suggestion is that one of the main reasons for RWL is the desire to be the best in a given weight category. For this reason, athletes do not hesitate to voluntarily lose weight. They are also guided by the desire to avoid categories in which they consider opponents to be too strong technically and, more importantly, physically. Coaches and technical support team members motivate athletes to practise RWL (Kons *et al.*, 2017) by forcing them to fight in lower weight categories.

Reasons related to the athletes

For one of the judokas (E3), RWL is essential to achieve good sporting performance. He *believes that the diet is essential for good performance*. The other respondents, on the other hand, did not share this view and believe that RWL is not essential. Thus, for athlete E7:

> *RWL is not essential for good performance. You can be in a higher category and perform or be in a lower category and produce the same results. RWL can be carried out or not be carried out according to everyone's objectives*".

Similarly, participant E1 *believes that the plan is not essential to good performance. For example, I can achieve results without dieting in -66kg*. RWL can, however, help the judoka to maintain his or her place in a category where he/she has the best chance of performing, as explained by judoka E11: *RWL is not essential but it can help to find yourself in a category where you have a better chance of achieving a good result*.

Overall, the majority of athletes say that RWL is not essential, but that this practice strengthens athletes' minds by giving them a sense of being able to compete successfully (Pettersson *et al*., 2013). This practice in judo, seems to be associated with sporting success in competition (Reale *et al*., 2016b). For some researchers, the problem is not weight loss in combat sports, but the way the weight is lost and the magnitude of the loss. If a good body mass loss and recovery strategy is observed, RWL can be an asset (Reale *et al*., 2016a), especially when accompanied by a good recovery technique after official weigh-in (Reale, 2018).

Actual practice of RWL

RWL strategies and techniques

Several methods have been identified in the literature as RWL techniques used by athletes (Reale *et al*., 2017). The inventory of these techniques was carried out in Europe and America. These include the use of hot baths, saunas, plastic suits, laxatives, diuretics, a significant decrease in food intake up to total voluntary food deprivation, voluntary vomiting and a drastic reduction in water intake (Franchini *et al*., 2012; Kons *et al*., 2017). In Côte d'Ivoire, judokas use these techniques, in particular, the reduction of food intake up to total food deprivation, as attested by participant E3: *for example, one takes only dry loaf of bread, without anything else as an accompaniment, until the next day*. During the period of food restriction, a change in dietary behaviour can also be observed, with a preference for fruit and vegetables to the exclusion of starchy foods, which are nevertheless a staple of the Ivorian diet. Respondent E7 says in this case, *I reduce my portion of food ... by taking only fruit in the evening*.

If the competition approaches and the expected weight is not reached, the athletes are completely deprived of food. On this topic, judoka E3 stated *in the evenings we are fasting*. Judoka E10 added that *if two or three days before the competition, the kilograms are not dropping easily, then I stop eating completely*. Food restriction or deprivation is generally not accompanied by total water deprivation, and many athletes prefer drinking water or fruit juice during RWL. Participant E10 pointed out the importance of regular water intake, insisting on the need to drink: *I stop eating completely, but I drink water*. Other athletes prefer limiting water consumption, as it is the case with judoka E8, who said, among other things, *I was reducing my water consumption*.

Judokas increase energy expenditure through additional training and jogging sessions. They *do more sport and increase the intensity of training*, as pointed out by respondent E4. Jogging sessions are usually associated with the use of plastic suits or very warm clothing, the purpose of which is to cause increased perspiration. Respondent E1, describing the practices of

his partners in this context, stated that *they wear plastic suits, K-Way and other types of thick clothing such as sweaters or jackets to jog*. These jogging sessions are generally carried out in the sun to maximise dehydration, as in the case of respondent E3, who reported that *after training in the judo room, we force ourselves to do jogging under the sun*.

When the excess kilograms do not disappear, athletes use even more aggressive methods, mainly laxatives. The following testimony is edifying on this issue. It is that of judoka E1, who stated that *in addition to this, we can add the use of drugs such as laxatives, to help eliminate kilograms* and that of participant E3, who stated that:

> *When 2 or 3 days before the competition, we do not have the expected weight drop, we have tablets that we use. These are small yellow tablets. If your weight is truly high, you take 4 tablets in the morning and 4 in the evening over a week. You're just going to have a bowel movement. Everything that enters the stomach will automatically come out, even water.*

Ivorian judokas do not use diuretics in general. None of them mentioned these products. Only laxatives are well-known and used. To obtain an effect almost similar to a sauna, Ivorian judokas use steam baths and hot baths, in which they remain immersed. Participant E12 explained that *once in international competition, I filled the bathtub with hot water and lay in it for at least 30 minutes at 1 o'clock in the morning and evening to lose weight*. This same athlete (E12) also said *I do steam baths*.

Another process was explained by an athlete. It is a matter of wrapping yourself in plastic film, putting warm clothes on top of the plastic and sleeping with these warm clothes, avoiding anything that can cool the body, to cause a decrease in body mass as indicated in essence by respondent E13: *I also sleep wrapped up in plastic, just like you would wrap a loaf of bread, I put on several layers of warm clothes. I also avoid turning on the fan at night. And I manage to lose weight*.

Ultimately, elite judokas use dietary restrictions, water restrictions, simple exercises, additional training or physical activities, plastic suits or warm clothing, laxatives and hot baths, as reported in the literature (Franchini *et al*., 2012). However, jogging in the sun is not always highlighted in European or American surveys.

Duration of RWL practice

Some athletes start RWL two weeks before a competition, with a slight reduction in their food intake, but it is actually in the last week that they intensify their weight loss to achieve individual goals, as described by respondent E7, who said that *personally to perform RWL, two weeks before the competition, I reduce my food intake for one week and the following week, I eat only once*.

The majority of judokas prefer to start RWL in the week before the competition because for them, it is difficult to control and maintain a low weight over a longer period of time, as evidenced by athlete E3 who explained that *this procedure is started one week before the competition to avoid having any problems with weight management. When the delay is longer than a week, it is difficult to maintain and manage this weight*.

In general, Ivorian athletes prioritise a one-week duration for RWL for the simple reason that maintaining a diet for two weeks is more difficult and weakens them much more. They prefer to perform this manoeuvre a few days before competition, intensifying it for the final 48 to 72 hours (Artioli *et al*., 2010a; Artioli *et al*., 2010b; Artioli *et al*., 2016; Reale *et al*., 2016; Kons *et al*., 2017). The loss of body mass, in a week or less, by methods inducing dehydration

can constitute a real danger to health, especially without medical follow-up and without an optimal strategy to preserve one's strength and health.

Frequency of RWL practice

Among the respondents, some systematically practise RWL at each scheduled competition, as is the case with participant E2, who stated about his practice that *I do rapid weight loss at each competition*. Other judokas state that they only perform RWL for the most important competitions, such as the E10 veteran who said, *I performed the diet at least twice a season, for the national championship and for the African championship*. These judokas target the competitions for which they perform RWL. They choose the competitions that present major challenges. This strategy was used by judoka E8, who specifies that he *performs diets mainly for competitions where national selections and international competitions are made. I do RWL three to four times a season*. The elite judokas in Côte d'Ivoire perform RWL on average three to four times per season as confirmed by participant E3 who remarked that *I do rapid weight loss four times per season*.

Concerning the age at which judokas begin this practice, two groups stand out, those athletes who start in the junior category and those who start in the senior category. For those who start early, the average age of our respondents is approximately 17 years old. Fighter E3 testified to this reality by saying *I did it for the first time in 2015 as a junior*. Judoka E1 confirms this trend because he *did it for the first time in 2002 as a junior*. The second group of judokas started this practice when they entered the senior category, at approximately 20 years old, following the example of participant E8 who declared that *I did it for the first time in 2014. My 1st year, I was senior. I was born in 1994*.

The frequency of practice of RWL (3 to 4 times per season) is lower than that observed in previous studies, which was approximately five times per season (Artioli *et al*., 2010b). However, it is similar to observations made in Taekwondo competitors (Santos *et al*., 2016). Ivorian judokas carry out RWL for a relatively short time, usually in less than a week before a competition (Artioli, 2010) and intensify it within 48 hours before the official weigh-in. No athlete practises RWL up to 10 times per season, as has been reported in some judoka populations (Artioli *et al*., 2010b). The age at which judokas begin this practice is higher than the age mentioned in the literature, which was 12 to 13 years (Artioli *et al*., 2010a). Indeed, as mentioned earlier, Ivorian judokas start RWL much later, at 17 years of age on average.

PRACTICAL APPLICATION

Based on results of this survey, it is necessary for judo federations, clubs and coach officials to improve their knowledge of RWL, especially with regard to its potential consequences. Officials will also need to put a strategy in place to discourage RWL among young athletes (juniors) and its practice during the sport season.

LIMITATIONS

The lower number of participant (male and female) was a limitation of this study. Future corroboration of these results with a larger male and female proportions is needed. In addition, future research should be focused on the real effects of RWL on physiological and biochemical parameters in elite judokas engaged in preparing for and participating in competitions.

CONCLUSION

This study was conducted to determine among the elite judokas of Côte d'Ivoire, the perception of RWL, its consequences, the reasons that lead them to use it and the different techniques used. This survey revealed that judokas often practise RWL from the age of 17 years, without having good perceptions of the consequences to their health status and performance. The main reasons for this practice are the fear of one's opponent and the desire for good results in competition. Judokas practise RWL three to four times a year using different techniques, including diet restriction and the use of laxatives.

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