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CURRENT OPINION

Is It Time to Look at Rapid Weight Loss in Paralympic Combat Sports?

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Abstract
Rapid weight loss is commonly employed by athletes in combat sports to compete in lower weight classes, but it can pose significant health risks, including dehydration, stroke, and kidney failure, especially when extreme methods are used. This practice is further complicated in Paralympic combat sports, where athletes with impairments face unique physiological challenges that increase the potential for injury and health complications. For athletes with impairments, rapid weight loss may exacerbate pre-existing conditions, affect movement patterns, and lead to injuries and fatigue. Additionally, the recent changes to judo weight classes for the 2024 Paris Paralympic Games could encourage even more extreme weight-cutting practices, raising concerns about athlete safety. This paper calls for further research to examine the effects of rapid weight loss in Paralympic combat sports, focusing on tailored monitoring strategies for hydration, body composition, and overall metabolic function to ensure the well-being of these athletes.

Key Points

Rapid weight loss practices in combat sports can significantly harm athletes' health, leading to dehydration, muscle loss, and other serious conditions, with these risks heightened for athletes with impairments.

Paralympic athletes face additional challenges when engaging in weight loss practices, as their unique physical and physiological characteristics can exacerbate the negative effects, such as increased risk of injury and impaired performance.

The introduction of new weight classes for the 2024 Paris Paralympic Games may encourage extreme weight-cutting practices, necessitating tailored monitoring strategies to ensure the safety and well-being of judo athletes with visual impairments.

1 Introduction

The practice of rapid weight loss has been widely used over the years in combat sports athletes who intend to compete in weight-class-based events, particularly in Olympic sports such as wrestling, [1] taekwondo, [2] and judo [3]. While

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rapid weight loss can offer a competitive advantage by allowing athletes to compete in lower weight classes, it poses significant health risks, especially if extreme or unsustainable methods are used [4–6]. Combat sports athletes usually lose close to 5% of body weight in 7–14 days before competition [6], but this number can be even higher. Judo athletes, for example, often reduce their body weight by 2–10% in the days leading up to competition, typically within 2–3 days before the weigh-in [7]. This rapid weight loss is achieved through various methods that induce hypohydration and starvation, such as prolonged fasting (> 24 h), exercising in plastic suits, using saunas, and severely restricting fluid intake [3, 8–10]. These aggressive techniques have been shown to pose serious health risks [5]. Despite the widespread use of such strategies, studies indicate that rapid weight loss can lead to several psychological effects, such as decreased short-term memory, concentration, and vigor, fatigue, depression, and increased aggressive behavior [3, 11] in addition to physiological harm, such as severe dehydration, stroke, kidney failure, and eventually even death [9,10].

A tragic example involves a mixed martial arts athlete who, after struggling to make weight for a competition, died from dehydration and stroke due to extreme weight cutting, highlighting the severe risks associated with weight-cutting practices [5, 12]. Interestingly, athletes who are familiar with rapid weight loss, known as weight cycling athletes, may experience long-term adaptation to the process, but even they have no protection against the negative impact of rapid weight loss on performance [8].

2 Weight Loss in Combat Sports and Possible Impact on Athletes with Impairments

In the context of Paralympic combat sports, these rapid weight loss strategies become more complex owing to the unique physical, physiological, and health characteristics of the athletes [4]. Paralympic athletes face distinct challenges related to their impairments, making weight loss not only a matter of performance but also one of health, safety, and fairness. In many Paralympic sports, such as judo and taekwondo, athletes must compete within specific weight categories (see Fig. 1).

In Paralympic combat sports, athletes with impairments, such as those competing in judo and Para taekwondo, may face unique challenges related to rapid weight loss, which is often required to compete in weight divisions (see Fig. 1). In general, impairments in these sports are primarily related to visual impairments in judo and physical impairments in Para taekwondo. For athletes with impairments (e.g., visual or physical), the physiological impacts of rapid weight loss can be more pronounced [10]. In combat sports, athletes typically engage in weight cutting to qualify for a specific weight category (Fig. 1), which may involve dehydration [13], caloric restriction [14], skeletal muscle [15], and intense physical exertion [1–3]. For athletes with impairments, such practices can place additional strain on their bodies, as their adaptive techniques or prosthesis may not support rapid weight loss as effectively as those of able-bodied athletes [10]. The physical stress on the body, combined with the possible limitations in mobility or coordination, increases the risk of injury or health complications [16].

Moreover, rapid weight loss can exacerbate pre-existing conditions or impairments, making it even more challenging for these athletes to recover or perform at their best [17]. For example, athletes with amputations or those using prostheses may experience discomfort or even injury from the pressure and altered movement patterns associated with weight loss. Another example relates to athletes with cerebral palsy or other neuromuscular impairments who may struggle with the added fatigue and reduced strength that result from rapid weight loss. The combination of physical stress, dehydration, and the adaptation required to manage impairments during weight cutting can lead to a higher risk of adverse effects such as muscle cramps, dizziness, fatigue, and long-term health issues [18]. Therefore, rapid weight loss poses even greater risks for athletes with impairments, requiring careful monitoring and tailored approaches to ensure their safety and well-being [4].

The impact of rapid weight loss may be more complex, particularly for athletes with visual and physical impairments. Athletes with visual impairments, particularly in judo's J1 class (Fig. 1), rely on auditory and tactile feedback to navigate competition, as they cannot rely on visual cues [19]. Rapid weight loss may affect these feedback mechanisms by altering an athlete's physical condition, potentially impacting their movement patterns and responsiveness [20]. While there is limited direct evidence on the specific effect of rapid weight loss on sensory feedback [21], changes in hydration [22], energy levels [23], and overall physical performance [1–3, 7,8] can influence an athlete's ability to process and respond to auditory and tactile cues effectively [19]. This reliance on sensory cues may lead to imbalances in muscle development [24], making weight loss more challenging and potentially leading to muscle weakness or joint instability [25]. In Para taekwondo, athletes with physical impairments, such as amputations, may experience altered muscle mass and metabolic rates, which can complicate their ability to lose weight safely [26]. For example, Eckard et al. [26] found that individuals who underwent unilateral or bilateral amputations experienced a significant increase in both fat and muscle mass, resulting in an overall weight gain. This highlights the challenges faced by athletes with physical impairments when engaging in rapid weight loss practices.

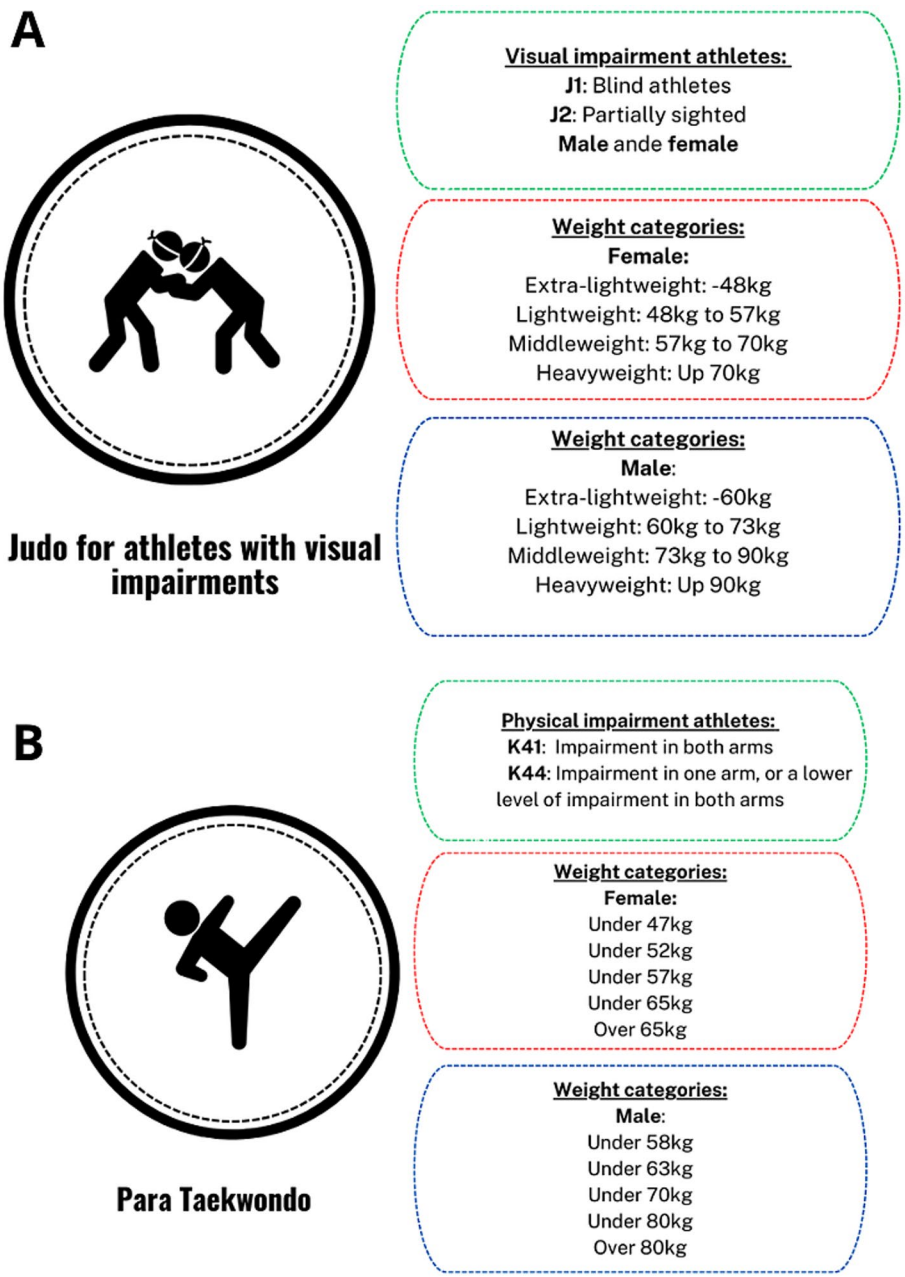

Fig. 1 Description of the sports class and respective weight categories of judo for athletes with visual impairments (**A**) and para taekwondo (**B**) until 2025

Given the significant impact of rapid weight loss on health-related outcomes, it is important to recognize the multi-faceted nature of Para athletes' health [4]. Rapid weight loss can disproportionately impact muscle mass in critical areas, resulting in reduced strength, stability, and endurance [2,3, 27]. In this context, extreme weight-cutting practices may further exacerbate dehydration, loss of lean body mass, fatigue, and impaired recovery, particularly in Para athletes, due to impairment-related physiological and functional limitations that can influence thermoregulation, energy expenditure, and exercise tolerance [26]. In this regard, key monitoring parameters during rapid weight loss can include specific instruments designed to track weight loss, such as body composition analyzers [27], as well as measures like urine specific gravity to assess hydration status [28]. Additionally, monitoring electrolyte balance, hydration status, and overall metabolic function can help ensure the process is managed safely and effectively [29].

The use of rapid weight-loss strategies in Paralympic combat sports remains underexplored, necessitating further research to determine whether and how they are employed. A recent study conducted with 30 Brazilian judo athletes with visual impairments (20 men and 10 women) revealed that most judo athletes lose weight to compete, but the interval to reduce weight seems slightly longer than usually occurs in rapid weight loss; even so, however, methods such as fluid

restriction still appear [10]. It is important to note that in this investigation, judo athletes with visual impairments lost approximately 3 kg during the pre-competitive period. While this weight loss is notable, it is considerably less than the range observed in able-bodied judo athletes, where previous studies have shown weight losses between 10 and 13 kg, corresponding to 13–17.5% of body mass [6]. More recently, Kons et al. [30] examined the impact of the new weight categories introduced for the Paris 2024 Paralympic Games and found that body mass was positively associated with performance outcomes in specific categories (r = 0.49–0.61), particularly among male middleweights. These findings suggest that competing near the upper weight limit may confer a competitive advantage, whereas unifying categories may disadvantage some Para athletes by altering previous competitive balances. In this context, managing body mass becomes even more critical, as a recent meta-analysis recommends that athletes should not exceed a weight loss of 5% of their body mass to ensure safety and performance [29].

An important aspect of weight loss practices is the ongoing evolution of competition formats, which reinforces the need for scientific investigation [30]. In Paralympic judo, recent structural changes, such as the reduction in weight categories for the Paris 2024 Paralympic Games, have significant implications for weight management strategies. Under this new system, athletes may be required to adjust their body mass more substantially to remain competitive within a given category [30]. For example, a male athlete previously competing in the -81 kg division may now need to reduce weight to -73 kg or increase body mass to compete at -90 kg [30]. Such adjustments represent a complex process that requires careful planning, particularly considering potential health and performance risks [4]. These changes could lead athletes to engage in rapid weight loss, a practice that poses concerns in able-bodied judo athletes [5–14]. While unifying weight classes may streamline competition, it may also create imbalances, as athletes in certain categories may face opponents with significantly higher body mass.

3 Conclusions

Rapid weight loss practices, commonly used in combat sports, pose significant health risks, especially when extreme methods are applied. These risks are heightened for athletes with impairments, who face unique physiological and physical challenges that complicate weight management and increase the likelihood of injury or adverse health effects. In addition, the introduction of new weight classes for the 2024 Paris Paralympic Games further complicates this issue, as athletes may need to engage in rapid weight loss to qualify for specific categories, intensifying the potential health risks. Monitoring methods such as body composition and hydration status will be crucial to ensure Para athlete safety and performance, particularly given the limited evidence on baseline metabolic health and the prevalence of metabolic syndrome in this population [31], independent of rapid weight-loss practices. Taken together, these considerations suggest that current weight-cutting practices may be inappropriate or unsafe for some Paralympic combat sports athletes [30], highlighting the need to develop tailored guidelines and evidence-based policies to ensure athlete health and safety [5]. Future research should focus on understanding the specific impact of weight-loss practices in Paralympic combat sports, with particular attention to the physiological challenges faced by athletes with impairments. Additionally, studies should consider organizational and contextual factors, such as competition-day weigh-in policies and financial incentives, as these may influence weight-loss behaviors in combat sports.

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Declarations

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Authors' contributions RLK conceived the idea for this manuscript. RLK conducted the literature search and drafted the manuscript. RLK, JAD, BR, RM, and DD critically revised the manuscript for important intellectual content. All authors read and approved the final version of the article.

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