



Comparative analysis of rapid weight loss among Brazilian and European Brazilian Jiu-jitsu practitioners of different levels

Análisis comparativo de la pérdida de peso rápida entre practicantes de Jiu-jitsu brasileño, brasileños y europeos de diferentes niveles

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Abstract

Introduction: Combat sports are defined by two individuals engaged in individual competition. Tournaments are divided into categories and in Brazilian Jiu-jitsu (BJJ), competitors perform rapid weight loss (RWL) in different ways and at different levels, and the level of different competitors can impact RWL.

Objective: analyzed the frequency and volume of RWL in different regions of the world (Brazil vs. Europe) and its different grades.

Methodology: This is an observational study, with 234 (77.7% M, 22.3% F) BJJ competitors. The RWL questionnaire (RWLQ) was applied using the Google Forms platform during interviews that were conducted in national-level competitions in Brazil, Ireland and Italy between the years 2022 and 2023. They were asked about weight loss history, frequency and percentage of RWL. Frequency and percentage were analyzed with the Mann-Whitney U test to compare weight loss, habits and routine of BJJ practice. The significance level applied was $p \leq 0.05$.

Discussion: The results indicate that in Brazil there are more black belts (35.4% vs. 23.3%), more professionals (24.5% vs. 11.6%) and the greatest weight loss was also seen in Brazil (8.4 kg vs. 5.2 kg). In Brazil, 67.3% are engaged in strength activities other than BJJ, while in Europe 44.2%.

Conclusion: We can conclude that there is no significant difference between the regions regarding the frequency and volume of RWL, however, the level of specialization of the sport, greater weight loss and graduation show a tendency to perform RWL.

Keywords

Body composition, brazilian jiu-jitsu, lose weight, martial arts, nutrition, performance.

Resumen

Introducción: Los deportes de combate se definen por dos individuos que participan en una competencia individual. Los torneos se dividen en categorías y en el Jiu-jitsu brasileño (BJJ), los competidores realizan pérdida rápida de peso (RWL) de diferentes maneras y en diferentes niveles, y el nivel de los diferentes competidores puede afectar la RWL.

Objetivo: analizar la frecuencia y el volumen de RWL en diferentes regiones del mundo (Brasil vs. Europa) y sus diferentes grados.

Metodología: Este es un estudio observacional, con 234 (77,7% H, 22,3% F) competidores de BJJ. El cuestionario RWL (RWLQ) se aplicó mediante la plataforma Google Forms durante entrevistas que se realizaron en competiciones a nivel nacional en Brasil, Irlanda e Italia entre los años 2022 y 2023. Se les preguntó sobre el historial de pérdida de peso, la frecuencia y el porcentaje de RWL. La frecuencia y el porcentaje se analizaron con la prueba U de Mann-Whitney para comparar la pérdida de peso, los hábitos y la rutina de la práctica de BJJ. El nivel de significancia aplicado fue $p \leq 0,05$.

Discusión: Los resultados indican que en Brasil hay más cinturones negros (35,4% vs. 23,3%), más profesionales (24,5% vs. 11,6%) y la mayor pérdida de peso también se observó en Brasil (8,4 kg vs. 5,2 kg). En Brasil, el 67,3% practica actividades de fuerza distintas al BJJ, mientras que en Europa es el 44,2%.

Conclusión: Podemos concluir que no existe una diferencia significativa entre las regiones en cuanto a la frecuencia y el volumen de RWL; sin embargo, el nivel de especialización del deporte, la mayor pérdida de peso y la graduación muestran una tendencia a practicar RWL.

Palabras clave

Artes marciales, composición corporal, jiu-jitsu brasileño, nutrición, perder peso, rendimiento.

Introduction

Combat sports involve highly competitive, individual engagements in which athletes typically compete within set weight categories to mitigate the risk of injuries due to disparities in body mass and strength (Fernandes Da Costa et al., 2024; Maurício et al., 2023; Roklicer et al., 2020). Weight divisions in combat sports were originally designed to ensure fair competition and reduce the likelihood of injuries from strength imbalances associated with significant differences in body weight (Reale et al., 2017). This practice is widely observed in sports like judo, wrestling, boxing, and Brazilian Jiu-Jitsu (BJJ). However, BJJ has a unique approach to weigh-in timing: according to its main federation, the International Brazilian Jiu-Jitsu Federation (IBJJF, 2024), athletes weigh in immediately before their first match. This protocol, which occurs just 10 to 20 minutes before competition, differs from many other combat sports that allow more recovery time post-weigh-in, making RWL particularly impactful in BJJ competition scenarios (Ferreira dos Santos et al., 2022; Maurício et al., 2023).

Current literature on rapid weight loss (RWL) in combat sports presents varied findings, with some discrepancies across sports and demographics. Ranisavljev et al. (2022) documented a comparison between male and female athletes, noting an average weight reduction of 3.8% among males and 3.1% among females. In Olympic combat sports, Baranauskas et al. (2022) found judokas, wrestlers, and boxers to exhibit RWL averages of 4.2%, 4.7%, and 4.8%, respectively. In contrast, Maurício et al. (2023) observed a 3.9% RWL among national-level BJJ competitors, which highlights both sport-specific and possibly region-specific variances in weight-cutting practices. Moreover, previous reviews, such as Maurício et al. (2022), have suggested that RWL up to 5% may not detrimentally impact strength and power among combat sport athletes, though this finding is still debated given the individual variability in athletes' responses.

The physiological and mental impacts of RWL, including effects on mood, cognition, and kidney function, remain a significant concern in the field (Brandt et al., 2018, 2021; Lakicevic et al., 2021; Nascimento de Carvalho et al., 2022; Maurício et al., 2024). However, studies suggest that resuming regular eating habits post-competition may help alleviate some of these adverse effects. For BJJ specifically, Barley et al. (2019) observed that RWL practices are widely prevalent, with 88% of BJJ athletes reportedly engaging in them. This rate was comparable to other combat sports such as judo, wrestling, and boxing but was notably lower than in mixed martial arts (MMA). Interestingly, Barley et al. (2019) also highlighted a distinctive competitive characteristic in BJJ athletes, where only 10% considered themselves professional competitors, 15% semi-professional, and the majority 74% identified as amateurs. Brito et al. (2012) added a layer to this by examining the practice experience among BJJ athletes (averaging 7.9 years) and noting that 56.8% reported RWL engagement. However, they did not account for competitive level or the potential differences across BJJ belt ranks, leaving a gap in understanding how RWL varies with experience and skill level within this specific sport.

The study of RWL practices in BJJ is still limited, particularly concerning regional differences between Brazilian and European athletes. Differences in training environments, cultural attitudes, and potentially even local regulations could all influence weight management strategies among athletes. While RWL in Brazilian Jiu-Jitsu has been examined broadly, specific analysis across regions and skill levels, including amateur, semi-professional, and professional athletes, remains underexplored. Such a focus is important because BJJ originated in Brazil, and practices in Brazilian athletes may differ significantly from those in other regions, where different training and cultural approaches could influence the extent and impact of RWL.

Given these inconsistencies, this study aims to provide a comprehensive analysis of the frequency, intensity, and health implications of RWL practices among Brazilian and European BJJ athletes across various skill levels and belt ranks. By examining these practices on a broader international scale, this research seeks to contribute to a clearer understanding of the factors influencing RWL in BJJ. Ultimately, the findings could help coaches, trainers, and sports professionals to develop safer, more effective weight management strategies tailored to BJJ athletes' specific needs and contexts (Ferreira dos Santos et al., 2024a). Furthermore, it may inform policy within BJJ federations about weigh-in timing and RWL practices, enhancing athlete safety (Ferreira dos Santos et al., 2022) and performance (Ferreira dos Santos, 2024).

This study analyses RWL frequency and volume across different regions (Brazil and Europe) and belt ranks, with the hypothesis that Brazilian BJJ practitioners may exhibit different RWL patterns than their European counterparts. Therefore, the study aims to provide insights that could influence both training and competitive standards within the sport of Brazilian Jiu-Jitsu.

Method

Study Design

This cross-sectional study was conducted through a questionnaire distributed via the Google Forms platform and in person at national-level Brazilian Jiu-Jitsu (BJJ) competitions in Brazil, Ireland, and Italy in 2022 and 2023. Participants were recruited on-site and invited to complete the survey with assistance from a single researcher, who ensured consistent administration across locations. Only athletes meeting the inclusion criteria were invited to participate, including adult BJJ practitioners aged 18 and older, representing various belt ranks and competition levels. Participants were informed of the study objectives, risks, and their right to withdraw at any time. Informed consent was obtained from each athlete before data collection. This study was conducted in compliance with the Declaration of Helsinki and received approval from the local Research Ethics Committee (approval number 57395822.0.0000.5286), ensuring adherence to ethical standards regarding confidentiality and voluntary participation.

Participants

A total of 234 adult BJJ competitors from Brazil, Ireland, and Italy participated in this study. To ensure diversity, the sample included both male and female athletes, spanning a range of belt ranks and competition levels (amateur, competitor, and professional). Exclusion criteria included athletes under 18 and those unable to provide informed consent. By including participants from multiple regions, the study aimed to compare RWL practices among Brazilian and European athletes, providing insight into potential cultural and regional variations.

A post hoc sample size calculation was conducted to determine whether the sample was sufficient to detect meaningful differences between Brazilian and European BJJ athletes regarding RWL. Based on the observed difference in maximum weight loss ($\Delta = 3.2$ kg) and an estimated pooled standard deviation of 6.5 kg, the required sample size per group was calculated using the formula for comparing two independent means: $n = [(Z_{1-\alpha/2} + Z_{1-\beta}) / (\Delta/\sigma)]^2 \times 2$. Assuming a two-tailed $\alpha = 0.05$ ($Z = 1.96$) and 80% power ($\beta = 0.20$, $Z = 0.84$), the required minimum was approximately 65 participants per group. With 148 athletes from Brazil and 86 from Europe, the study exceeded the required sample size and was adequately powered to detect significant differences in RWL between regions.

Questionnaire and Instrumentation

The Rapid Weight Loss Questionnaire (RWLQ), a validated self-report instrument originally developed to assess rapid weight loss practices in combat sports, was adapted for use with BJJ athletes (Artioli et al., 2010). To tailor the RWLQ specifically to the BJJ community, adjustments were made to include terminology and language familiar to BJJ practitioners (Artioli et al., 2010). The questionnaire was reviewed and piloted with a small sample of BJJ athletes to ensure clarity and relevance. The RWLQ was translated and made available in Portuguese, English, Spanish, and Italian to facilitate comprehension and accuracy across language groups (Artioli et al., 2010). Consistency in language use and questionnaire formatting was maintained to ensure that responses were comparable across regions (Artioli et al., 2010).

Procedures

The adapted RWLQ (Artioli et al., 2010) was administered through Google Forms, allowing for both online and in-person data collection from active BJJ athletes. Participants completed a validated questionnaire ($\alpha = 0.98$) under the researcher's supervision at competition sites, ensuring standardized instructions and responses (Artioli et al., 2010). The study purpose was explained in detail, and participants were encouraged to answer accurately. The survey collected a range of data, including demographic information (age, gender), competition experience (belt rank, years of BJJ practice, and weekly training

hours), and RWL behaviours. Specific variables examined included injury history, extent of weight loss, frequency of rapid weight loss in the past two years, greatest amount of weight lost, age of initial RWL practice, use of weight loss counselling, and changes in weight category over the past two years. Competitive level was categorized as amateur (rarely competes), competitor (regularly competes), or professional (competes professionally and relies on sport for income) (Artioli et al., 2010).

Measurements

Participants provided demographic data and information on weight management practices, including initial weight, height, history of RWL, and the frequency of weight loss attempts in the last two years. Additional details gathered included the greatest weight lost during RWL, age at onset of RWL, sources of weight loss guidance, and competitive details like belt rank and classification level. These metrics enabled comparisons between Brazilian and European competitors regarding their RWL practices, examining potential variations based on regional, cultural, and competitive factors (Artioli et al., 2010).

Statistical Analysis

Statistical analyses were performed using SPSS 20.0 software for Windows. Descriptive statistics were used to calculate frequencies and percentages for categorical responses. Mann-Whitney U tests were applied for pairwise comparisons (e.g., Brazil vs. Europe) due to the non-parametric nature of the data. When significant differences were identified, post-hoc analyses were performed to determine specific group contrasts. Confounding variables, such as gender, age, and experience level, were considered in the analysis to ensure accurate comparisons across groups. A significance level of $p \leq 0.05$ was applied for all statistical tests. Effect sizes were calculated using Cramér's V for chi-square tests and r for Mann-Whitney U tests, following McHugh (2013), according to Cohen's classification for effect size interpretation (small: $V = 0.10$, medium: $V = 0.30$, large: $V = 0.50$) (Cohen, 1988).

Results

Out of 234 participants, 148 were from Brazil (116 male) and 86 from Europe (66 male), with an age of 31.3 (9.2) years and a weight of 78.2 (14.1) kg. Participants had been practicing BJJ for 5 to over 10 years (56.1%), with the majority being black belts ($n=72$, 30.9%), followed by blue belts ($n=56$, 24%). Most participants practiced more than 9 hours per week (27%) and engaged in other strength-related activities such as weightlifting, physical conditioning, and CrossFit (58.8%). Nearly half identified as regular competitors (46.8%), and the majority reported no change in weight category in the past two years (56.7%), as detailed in Table 1.

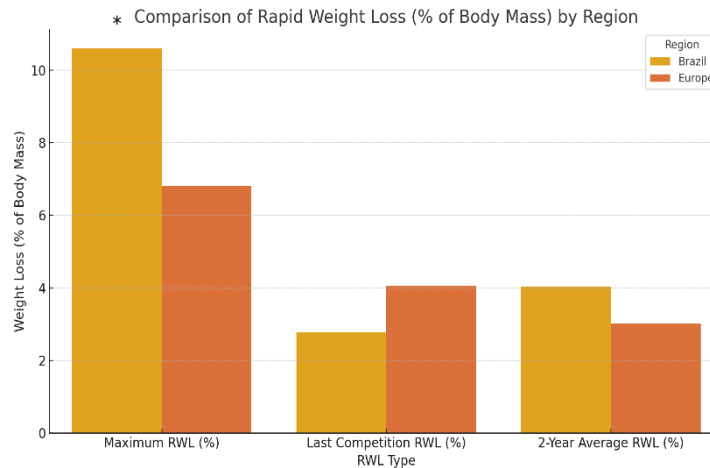
Table 1. Percentages and frequencies of participants regarding gender, age, weight, height, belt rank, weight loss, and weight category change

Participants	Brazil N (%)	Europe N (%)	All N (%)
Gender			
Male	116 (78.2)	66 (76.7)	181 (77.7)
Female	32 (21.8)	20 (23.3)	52 (22.3)
Age	30.2 (8.3)	33.1 (10.3)	31.3 (9.2)
Weight (Kg)	79.3 (14)	76.3 (14)	78.2 (14.1)
Height (M)	1.7 (0.1)	1.7 (0.1)	1.7 (0.1)
Belt			
White	13 (8.8)	16 (18.6)	29 (12.4)
Blue	30 (20.4)	26 (30.2)	56 (24)
Purple	32 (21.8)	16 (18.6)	48 (20.6)
Brown	20 (13.6)	8 (9.3)	28 (12)
Black	52 (35.4)*	20 (23.3)	72 (30.9)
Weight Loss			
Rapid Weight Loss (Kg)	2.2 (1.8)	3.1 (3.6)	2.6 (2.6)
X Weight Loss (2 Years)	3.2 (4.5)	2.3 (2.5)	2.8 (3.8)
Highest Weight Loss (Kg)	8.4 (7)*	5.2 (5.8)*	7.2 (6.8)*
Beginning Weight Loss (Age)	19.9 (10.9)	21.6 (12.5)	20.5 (11.5)
Changed Weight Category			
No	67 (45.6)	65 (75.6)*	132 (56.7)
Moved Down	24 (16.3)	8 (9.3)	32 (13.7)
Moved Up	56 (38.1)*	13 (15.1)	69 (29.6)

* = statistical significance ≥ 0.05

No significant gender differences were observed between Brazilian and European athletes ($p = 0.772$, no there were significant differences in age ($p = 0.058$) or height ($p = 0.244$). However, a significant difference in belt distribution was observed ($\chi^2 = 10,285$, $p = 0.036$, $V = 0.210$), with Brazilian athletes more frequently holding black belts (35.4%) compared to Europeans (23.3%). Figure 1 highlights the weight loss by region.

Figure 1 Comparison of Rapid Weight Loss (% of Body Mass) by Region (Brazil vs. Europe).



Regarding weight loss, Brazilian athletes reported significantly greater maximum weight loss, with 8.4 (7) kg, compared to Europeans, with 5.2 (5.8) kg, ($\chi^2 = 60,295$, $p = 0.003$, $V = 0.508$) / ($U = 3828$, $p < 0.001$, $r = 0.24$). RWL in the last competition and total weight lost over the past two years did not differ significantly between groups ($p > 0.05$). Brazilian athletes and Europeans began engaging in RWL at a slightly younger age [19.9 (10.9) years] and [21.6 (12.5) years], groups were not different ($p = 0.352$).

A significant association was found between region and weight category changes over the past two years ($\chi^2 = 20.60$, $p < 0.001$, Cramér's $V = 0.297$). Specifically, 38.1% of Brazilian athletes reported moving up a weight category, compared to only 15.1% of Europeans. Conversely, 75.6% of Europeans reported maintaining their weight category, versus 45.6% of Brazilians.

Further details, including practice time, weekly training hours, participation in other activities, and self-perception of practice, are provided in Table 2.

Table 2. Practice time, weekly training hours, participation in other activities, and self-perception

Participants	Brazil	Europe	All	Sig
	N (%)	N (%)	N (%)	
Practice Time				0.007
1 Year	0 (0)*	10 (11.6)*	10 (4.3)*	
1 ~ 3 Years	8 (5.4)	10 (11.6)	18 (7.7)	
3 ~ 5 Years	39 (26.5)	19 (22.1)	58 (24.9)	
5 ~ 10 Years	44 (29.9)	22 (25.6)	66 (28.3)	
>10 Years	56 (38.1)*	25 (29.1)*	81 (34.8)*	
Training hours				0.105
3 Hours	15 (10.2)	9 (10.5)	24 (10.3)	
3 ~ 4,5 Hours	30 (20.4)	19 (22.1)	49 (21)	
4,5 ~ 6 Hours	27 (18.4)	24 (27.9)	51 (21.9)	
6 ~ 9 Hours	28 (19)	18 (20.9)	46 (19.7)	
>9 Hours	47 (32)	16 (18.6)	63 (27)	
Other Activities				0.368
None	29 (19.7)	23 (26.7)	52 (22.3)	
Physical Conditioning, Weight lifting or Crossfit	99 (67.3)	38 (44.2)	137 (58.8)	
Fights	5 (3.4)	13 (15.1)	18 (7.7)	
Fights or preparation	6 (4.1)	3 (3.5)	9 (3.9)	
Aerobic Exercise	3 (2)	1 (1.2)	4 (1.7)	
Other Activities	5 (3.4)	8 (9.3)	13 (5.6)	
Self-Proclaimed				0.021
Amateur	44 (29.9)	34 (39.5)	78 (33.5)	
Competitor	67 (45.6)	42 (48.8)	109 (46.8)	

Professional	36 (24.5)*	10 (11.6)*	46 (19.7)*
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* = statistical significance ≥ 0.05

As shown in Table 2, none of the Brazilian competitors reported having less than one year of practice, with a higher frequency reporting over 10 years of experience. Practice experience also differed significantly by region ($\chi^2 = 22.061$, $p = 0.000$, $V = 0.307$). No Brazilian athletes reported less than one year of practice, whereas 11.6% of European athletes fell into this category. More Brazilians had over 10 years of practice (38.1%) compared to Europeans (29.1%).

No significant difference was found in weekly training hours ($p = 0.105$), 18.6% of Europeans and 32% of Brazilian athletes reported training more than 9 hours per week. Participation in additional strength-related activities (e.g., CrossFit, resistance training) was reported among Brazilians (67.3%) and Europeans (44.2%) without statistical significance ($p = 0.368$).

A significant difference was found in self-perceived athlete identity ($\chi^2 = 6.56$, $p = 0.038$, $V = 0.167$). While most participants in both regions identified as competitors, a greater proportion of Brazilians considered themselves professional athletes (24.5%) compared to Europeans (11.6%).

Discussion

This study aimed to compare RWL practices between Brazilian and European BJJ athletes across different competitive levels and training profiles. The results revealed that while the frequency of RWL was similar between regions, Brazilian athletes reported significantly greater absolute weight loss (8.4 kg vs. 5.2 kg), began weight-cutting practices earlier, and more frequently identified as professionals. Additionally, Brazilian practitioners had a higher proportion of black belts, more years of practice, greater weekly training volumes, and higher engagement in strength-based training compared to European athletes. These findings suggest that cultural, experiential, and structural factors have potential to distinct RWL behaviours between regions, highlighting the importance of context-sensitive strategies to manage athlete health and performance.

Athletes in different combat sports, including BJJ, wrestling, judo, boxing, karate, and MMA, commonly employ RWL techniques (Martínez-Aranda et al., 2023). However, BJJ differs from sports like boxing and MMA due to its weigh-in protocol, where weigh-ins occur shortly before the first match, leaving only a brief interval, typically no more than 20 minutes, between weigh-in and competition (IBJJF, 2021). The weigh-in structure in BJJ underscores the immediate impact of RWL on performance, as athletes have limited time for physical and mental recovery post-weight cut, a factor that likely affects BJJ competitors differently from those in sports with longer recovery times.

In MMA, similar high percentages of weight loss, sometimes up to 9% of an athlete's initial body weight, have been associated with decreased performance, as shown by a 10% reduction in handgrip strength in athletes who underwent substantial RWL (Alves et al., 2018). A case study by Camarço et al. (2016) observed that an MMA athlete who lost 9.1% of body weight showed a significant decrease in performance, while an athlete who lost 5.3% did not experience this decline, indicating that more moderate RWL may have less impact on strength. Our findings are consistent with this threshold, suggesting that many Brazilian BJJ athletes may be exceeding the 5% mark, which could place them at higher risk of performance decrements. In Brazilian BJJ, however, the higher weight loss average suggests a need for further research into whether this practice impacts physical performance and recovery, especially since weigh-ins occur so close to the competition.

In Olympic combat sports, Baranaukas et al. (2022) found average weight losses of 3.1 kg (SD = 1.5) in boxing, judo, and wrestling, equating to approximately 4.6% of body weight, with boxing having the highest percentage at 4.8%. This agrees with findings by Mauricio et al. (2022), who noted that RWL of less than 5% did not impair performance. Additionally, weight recovery after RWL has been linked to better performance outcomes; Faro et al. (2022) reported that for every 1% of weight regained, athletes had a 4.5% increased chance of victory. In this context, our results provide a relevant contrast: although Brazilian and European BJJ athletes follow similar RWL frequencies, the higher absolute losses reported by Brazilian athletes may limit their capacity for full recovery, especially under IBJJF protocols.

The higher average weight loss observed in Brazilian BJJ athletes could be attributed to the tendency among black belts and professional competitors in Brazil to engage in greater weight loss for competition, as shown by the higher proportion of black belt practitioners (35.4%) in Brazil compared to Europe (23.3%). Furthermore, a larger percentage of Brazilian athletes identified as professionals (24.5% vs. 11.6%), supporting previous findings that higher competition levels correlate with more frequent and substantial RWL (Artioli et al., 2010). Our findings enhance information on earlier studies by adding regional context to the relationship between competitive level and weight-cutting behaviour.

Another aspect to consider is the impact of extensive experience on RWL practices. The results showed that athletes with more years of practice and higher belt ranks, particularly black belts, are more likely to engage in substantial weight loss for competition. Prior studies in grappling sports have reported an average RWL of 5-6% in athletes with approximately five years of experience (Barbas et al., 2011; Finaud et al., 2006; Kurylas et al., 2019). Brito et al. (2012) found that 88% of BJJ practitioners engage in RWL, with an average practice time of 7.9 years, which aligns with our findings showing a higher concentration of experienced practitioners in Brazil (68% with more than five years of experience) compared to Europe (54.7%). These results corroborate the idea that athlete maturity and exposure to elite training environments are linked to increased RWL engagement. The increased dedication to strength-based training, observed more frequently among Brazilian athletes (67.3% vs. 44.2% in Europe), further supports this, as it indicates a potential specialization in Brazil, where athletes are more inclined to engage in comprehensive training regimens. This pattern may reflect cultural values in Brazilian BJJ, where physical preparedness and discipline are deeply embedded in the sport's identity, often emphasized in training academies and competition preparation. In contrast, European competitors may be subject to stricter regulations or possess a more health-focused sporting culture, which may limit aggressive weight-cutting (Artioli et al., 2010; Brito et al., 2012).

In terms of training volume, the data shows a clear trend in which higher belt ranks correlate with more weekly training hours, potentially leading to greater commitment to RWL. This finding reflects the investment in time and effort typical of advanced practitioners. For instance, black belts reported training over nine hours weekly, underscoring the strong connection between belt rank and dedication. Brazilian Jiu-Jitsu's roots in Brazil may contribute to this cultural commitment, with many practitioners investing substantial time and resources into the sport. Additionally, the role of black belts in the BJJ community as instructors, authorized to promote students and lead classes, creates professional opportunities tied to maintaining competitive fitness and rank status (IBJJF, 2022). This pathway to professionalism could also partially explain the higher RWL frequency among black belts, who may feel an obligation to meet specific physical and competitive standards within their roles.

A regional difference emerged in recent weight category changes. In Brazil, a higher number of competitors moved up in weight class (38.1%) compared to only 15.1% in Europe. Conversely, European competitors were more likely to maintain their weight category (75.6% vs. 45.6% in Brazil). This discrepancy could reflect differences in competitive culture and career progression between regions, suggesting that Brazilian competitors may experience pressures or expectations to adjust weight classes more frequently, possibly as a strategy to adapt to local competition dynamics. Moreover, the moderate association between region and weight category change ($V = 0.295$) reinforces the idea that geographic and cultural context plays a meaningful role in shaping weight management behaviours among athletes.

In addition, only 5.4% of Brazilian practitioners had less than three years of experience, compared to 23.2% in Europe. This difference in experience levels may influence athletes' likelihood of changing weight categories, as newer competitors may be less inclined or capable of engaging in RWL. Cultural factors such as early specialization, mentorship by high-level coaches, and institutional expectations within Brazilian academies may encourage more aggressive strategies earlier in the athlete's development.

Several limitations should be acknowledged in this study. Although interviews were conducted in a competition setting to capture responses close to the athletes' competitive moments, the environment may have influenced responses. Factors such as noise, adrenaline, and pre- or post-match stress might have affected the accuracy of self-reported data. Additionally, the study did not collect information on match outcomes, which could have provided insight into the relationship between RWL practices and performance. Future studies should consider incorporating objective performance measures, such as strength

and endurance assessments, and post-match outcomes to better assess the impact of RWL on competitive success. Furthermore, longitudinal studies observing how RWL habits evolve across an athlete's career and their potential long-term health impacts would be valuable in understanding the sustained effects of weight management in BJJ.

Regarding practical implications, these findings have practical implications for coaches, trainers, and sports organizations. A greater understanding of regional and experience-based variations in RWL can help inform the development of safer, more tailored weight management practices. Coaches may consider setting stricter RWL limits, especially for less experienced athletes or those competing at amateur levels, to minimize the health risks associated with excessive weight loss. BJJ federations and governing bodies may benefit from reviewing their weigh-in policies, particularly the brief interval between weigh-ins and competition, and consider adjusting protocols to promote safer practices. Moreover, educational initiatives addressing cultural norms around weight cutting may prove essential for long-term athlete health.

Conclusions

In the present study, while significant regional differences were observed between Brazil and Europe, RWL practices in BJJ show no substantial variation in frequency or total weight lost between these areas. This is particularly relevant as BJJ's brief interval between weigh-in and competition allows limited recovery time, heightening the risks associated with RWL. Therefore, reducing RWL practices should be encouraged within the sport to prioritize athlete safety and performance.

Higher levels of specialization in BJJ, along with advanced belt ranks, correlate with increased engagement in RWL, suggesting that athletes at these levels may face greater pressure to cut weight. Given these findings, it is recommended that coaches, trainers, and governing bodies implement guidelines for safer weight management, especially for experienced athletes who often compete with minimal recovery time. Such measures could include education on the risks of excessive RWL, promoting gradual weight management strategies, and re-evaluating weigh-in protocols.

Future research should further explore the health impacts of RWL in BJJ, particularly through longitudinal studies that assess long-term physical and psychological outcomes. Additionally, studies that incorporate objective performance metrics immediately following RWL could offer valuable insights into how weight loss affects athletes' competitive success.

These findings contribute to the broader understanding of RWL practices in combat sports and underscore the importance of establishing safer weight management practices within BJJ, where both athlete health and performance are essential.

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