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Body Mass Management Practices of Olympic Weightlifting Athletes

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This study explored the body mass (BM) management practices among competitive male and female Olympic weightlifting athletes, hypothesizing that athletes compete in lighter weight categories than their habitual training weight (i.e., making weight). Utilizing a validated, anonymous survey, data were collected from 149 Olympic weightlifting athletes (>18 years; female = 94). The survey comprised five sections: demographics, training/competition history, weight history, source of influence, and BM management practices. The prevalence, magnitude, and methods employed for BM management were analyzed with subgroup analysis using one-way analysis of variance. Post hoc testing including Spearman's rho and chi-square analysis was completed when a significant effect was found. Three quarters (76%) of athletes acknowledged using chronic weight loss and/or acute weight loss strategies to make weight. Usual BM loss (2%–3%) in the week before competition was within recommended guidelines. Gradual dieting, fluid restriction, and low food weight, high-calorie options were the most commonly used BM management strategies. Female athletes were more likely to use gradual dieting ($p = .043$; $r = .104$) and were less likely to increase their exercise ($p = .046$; $r = -.105$) and utilize fasting ($p = .038$; $r = .05$) compared with their male counterparts. Women further identified dietitians/nutritionists ($p = .006$; $r = .022$) as a highly influential source of information. This research offers new insights into the BM management practices of Olympic weightlifting athletes, identifying that the majority of athletes compete at a BM lighter than their habitual training weight, achieved using a range of chronic weight loss and acute weight loss strategies.

Keywords: weightlifters, rapid weight loss, strength-sport

Olympic weightlifting (OWL) is one of seven weight-category sports in the Olympic Games, accommodating a wider range of categories than any other sport. In each weight category, an athlete's heaviest successful attempt in both the snatch and clean and jerk is combined, and the athlete with the highest combined weight wins the competition. OWL is unique among weight category sports given the critical role that velocity and force play in defining success (Fry et al., 2006).

Athletes in weight-category sports typically use a range of acute weight loss (AWL, i.e., weight loss undertaken in the final days and hours prior to competition) and/or chronic weight loss (CWL, i.e., weight loss in the weeks to months prior to competition) strategies. Athletes may use these strategies to compete in a category lighter than their habitual training weight under the premise that this provides a competitive advantage over smaller opponents (Burke et al., 2021). Concerns have been raised about the health and performance implications of the body mass (BM) management practices employed by these athletes (Artioli et al., 2010; Reale et al., 2018). AWL has been linked to adverse health outcomes (Barley et al., 2019; Barley et al., 2018; Berkovich et al., 2019; Kasper et al., 2019), and in some cases, death (Centers for Disease Control and Prevention, 1998). The majority of research exploring the BM management practices of athletes in weight category sports has remained focused on combat sports (Anyzewska et al., 2018; Barley et al., 2019; Brito et al., 2012; Connor & Egan, 2019; da Silva Santos et al., 2016; Franchini et al., 2012; Hillier et al., 2019; Matthews et al., 2019; Park et al., 2019; Reale et al., 2018). Less is known about the BM management practices of athletes in OWL, despite the former being a summer Olympic Games event for over 100 years.

OWL athletes' physical traits are less impacted by acute compromises in hydration status (Barley et al., 2018) and muscle energy reserves (Barley et al., 2018; Pallarés et al., 2016; Reale et al., 2018; Schytz et al., 2023). This may leave OWL athletes curious about the use of common AWL strategies targeted at the manipulation of total body water (TBW). Indeed, the most commonly used methods reported by powerlifters include water loading (Campbell et al., 2023; Nolan et al., 2022) and fluid restriction (Campbell et al., 2023; King et al., 2023; Kwan & Helms, 2022; Nolan et al., 2022). Although the physical demands of powerlifting and OWL are similar (Gee et al., 2023; Keogh et al., 2007; Serrano et al., 2019), OWL has a shorter time between weigh-in and competition and a shorter competition duration (Burke et al., 2021), which may impact the athletes' ability to recover from any AWL strategies. These individual sport nuances, including time frame between weigh-in and competition, the requirement for repeat weigh-ins, and culture of weight loss, make inferring athlete practices and outcomes between sports inappropriate (Burke et al., 2021; Reale et al., 2017). To our knowledge, only one other study has assessed the BM management practices of OWL athletes, undertaken on a small sample of athletes using a tool not validated for that population (Gee et al.,

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2023). Our research group has recently validated a rapid weight loss questionnaire in OWL athletes (Cox et al., 2024), creating an opportunity to better explore the BM management practices of OWL athletes.

This study aimed to investigate the BM management practices of competitive male and female OWL athletes using a validated questionnaire (Cox et al., 2024). It was hypothesized that OWL athletes compete in a weight category lighter than their habitual training weight, achieved via a range of acute and/or chronic BM management practices. It was also hypothesized that athletes of higher caliber would be more likely to use AWL practices and that there would be no impact of sex on BM management practices.

Methods

Competitive male and female OWL athletes (>18 years) at Queensland state championships in Brisbane, Australia, were invited to complete an anonymous online questionnaire (voluntary response sampling). The survey was advertised for 7 days prior to the competition on social media platforms, including Instagram and Facebook. In addition, eight flyers were posted around the competition venue, featuring a QR code for easy access to the questionnaire. To facilitate survey completion, two iPads were made available for athletes. Announcers at the event also promoted the survey. A designated location was manned throughout competition hours where athletes were encouraged to fill out the survey. The survey was retrospective in nature, asking athletes to focus on competitions during the previous 2 years. This research project was approved by the human research ethics committee (University of the Sunshine Coast, Australia), ethics approval number S221696, and participants provided informed consent after having the study explained either verbally and/or in writing.

The survey used in this investigation has previously been validated in OWL athletes (Cox et al., 2024). It comprised five different sections, including demographics, training and competition history, weight history (maximum and usual weight loss), source of influence on BM management strategies, and BM management practices, that is, retrospective exploration of usual practices. Athletes' responses were collected online via Qualtrics Core XM survey software (Qualtrics LLC).

Although athletes were required to specify their usual competition weight category in the previous 2 years, these categories were subsequently consolidated by researchers into the following four weight category groups for both sexes. Light weight (≤73 kg for male athletes, ≤55 kg for female athletes), middle weight (>73 kg to ≤96 kg for male athletes, >55 kg to ≤71 kg for female athletes), heavy weight (>96 kg to ≤109 kg for male athletes, >71 kg to ≤87 kg female athletes) and super heavy weight (+109 kg for male athletes, + 87 kg for female athletes). The caliber of each athlete was classified using a recognized tiering system wherein 1 denotes *recreational level* and 5 indicates *world-class standing* (McKay et al., 2022).

Statistical Analysis

Descriptive statistics (i.e., mean, *SD*, range and frequency analysis) were used to represent subject characteristics and responses to survey questions providing ordinal and nominal data. Numeric values for the question "how much weight do you usually lose in the 24 hours, week, month and two months prior to competition" were provided as a range. When analyzed, the mean of the range was used, that is, 0–1 = 0.5 kg. The result for the question related to source of influence was consolidated by researchers into three groups, "highly influential" (highly influential and very highly influential questionnaire responses), "a little influential," and "not influential." The questionnaire response "unsure" was removed for analysis. For analysis of caliber, tiers were consolidated into two groups (Tiers 1–2, and Tiers 3–5). A one-way analysis of variance was used to compare influence against independent variables (sex, athlete caliber, weight category group). When a significant effect was identified ($p \leq .05$), post hoc testing was performed using chi-square test for independence. Frequency analysis for male and female BM practices were split into "currently using" and "not using" and compared against independent variables. When a significant effect was identified ($p \leq .05$), post hoc testing was performed using Spearman's rho test.

Results

Of the 174 athletes who initiated the survey, 25 incomplete data sets ($n = 23$ did not identify if they had made weight, $n = 2$ did not answer sources of influences/BM practices) were removed from all analysis. A descriptive analysis of the remaining athletes is presented in Table 1, and athlete caliber is presented in Table 2. Lower caliber athletes were more likely to use low fiber ($p = .014$; $r = -.218$), spitting ($p = .003$; $r = -.290$), and sauna ($p = .010$; $r = -.245$) to make weight. Of the 149 athletes, 76% of athletes have previously used CWL and/or AWL strategies to make weight. Three of these athletes acknowledged failing to make weight for a competition.

In the previous 2 years, 51% ($n = 68$) of athletes had competed at a BM outside of their usual category. The most common reasons for competing in another weight category are specified in Table 3. Sources of information influencing the BM management practices of OWL athletes are presented in Table 4. Female athletes identified dietitians/nutritionists as a highly influential source of information ($p = .009$; $r = -.250$), but there were no other differences identified according to athlete caliber, weight category, or training age/competition age.

Tables 5 and 6 present a frequency analysis of the self-reported BM management methods and time frame of use among female and male athletes, respectively. The most prevalent practices used by women included gradual dieting (83%), fluid restriction (71%), a low carbohydrate diet (52%), and low food weight/high-calorie options (51%). Men identified gradual dieting (74%), fluid restriction (71%), and low food weight/high-calorie food options (55%) as their most commonly used practices. For statistical significance, when comparing sex against strategies, female athletes were more likely to use gradual dieting ($p = .043$; $r = -.192$) and were less likely to increase their exercise ($p = .063$; $r = -.177$) and utilize fasting ($p = .035$; $r = .201$) in comparison with their male counterparts.

Discussion

This is the first study to assess the BM management practices of both male and female OWL athletes prior to competition using a tool validated specifically for an OWL population. The majority of OWL athletes competed at a BM lighter than their habitual training weight, aligning with other preliminary findings in OWL athletes (Gee et al., 2023) and other weight-category sports (Alderman et al., 2004; Anyzewska et al., 2018; Artioli et al., 2010; Brito et al., 2012; Campbell et al., 2023; Connor & Egan, 2019; Franchini

Table 1 OWL Athletes' Characteristics According to Weight Categories

	Weight category							
	Male				Female			
	Light weight ($n = 5$)	Middle weight ($n = 38$)	Heavy weight ($n = 9$)	Super heavy weight ($n = 3$)	Light weight ($n = 18$)	Middle weight ($n = 49$)	Heavy weight ($n = 23$)	Super heavy weight ($n = 4$)
Age (years)	34 ± 8	29 ± 11	38 ± 16	31 ± 3	33 ± 14	32 ± 11	32 ± 10	24 ± 5
Weight (kg)	81.4 ± 6.6	84.1 ± 10.1	101.8 ± 7.7	110 ± 28	55.7 ± 3.9	67.2 ± 5.4	81.7 ± 6.4	117.3 ± 24
Height (cm)	172.6 ± 2	174.9 ± 5.9	185.4 ± 9.1	182 ± 9.5	155.3 ± 4.6	163.5 ± 6.8	170.2 ± 6.4	171 ± 3
Age began practicing OWL	21 ± 6	23 ± 8	25 ± 8	17 ± 6	29 ± 12	27 ± 9	28 ± 8	18 ± 9
Age began competing in OWL	22 ± 5	24 ± 9	28 ± 9	17 ± 6	30 ± 12	28 ± 10	29 ± 9	18.9
Competitions in the past 12 months?	5 ± 3	3 ± 2	2 ± 1	2 ± 2	3 ± 1	3 ± 2	3 ± 3	2 ± 1
Athletes who have made weight before, *n* (%)	5 (100)	28 (74)	6 (67)	3 (100)	18 (100)	34 (69)	16 (70)	1 (25)
What is the most weight you have ever lost to compete (kg)?								
Mean ± *SD*	4 ± 1.3	4.3 ± 1.9	4.5 ± 2.3	9 ± 2.6	2.2 ± 0.9	3.4 ± 1.7	3.7 ± 2.7	2
Range	2–5	2–8	2–8	7–12	1–5	1–9	1–11	
What is the most weight you have ever lost in the week before competition (kg)?								
Mean ± *SD* (%)	1.8 ± 0.4	3 ± 1.4	4.5 ± 2.6	4.7 ± 1.5	1.7 ± 0.8	2 ± 1.7	2.2 ± 1.2	1
Range (%)	1–2	1–7	2–8	3–6	1–3	1–5	1–5	
How much do you usually lose in the last 24 hr before competitions (kg)?								
Mean ± *SD* (%)	1.5 ± 1.1	1 ± 0.8	2.8 ± 2.7	2.2 ± 1.2	0.9 ± 0.5	0.6 ± 0.4	0.7 ± 0.4	0.5
Range (%)	0.5–3.5	0.5–3.5	0.5–7.5	1.5–3.5	0.5–1.5	0.5–1.5	0.5–1.5	
How much do you usually lose in the last week before competitions (kg)?								
Mean ± *SD* (%)	1.1 ± 0.5	2 ± 1.3	3 ± 2.5	2.2 ± 1.2	1.1 ± 0.8	1.3 ± 0.8	1.4 ± 0.7	1.5
Range (%)	0.5–1.5	0.5–5.5	0.5–7.5	1.5–5.5	0.5–3.5	0.5–3.5	0.5–3.5	
How much do you usually lose in the last month before competitions (kg)?								
Mean ± *SD* (%)	3.5 ± 1.3	2.1 ± 1.6	2.7 ± 0.5	3.5 ± 2	1.9 ± 1.4	1.9 ± 1.4	2.1 ± 1	1.5
Range (%)	1.5–5.5	0.5–5.5	0.5–7.5	1.5–5.5	0.5–5.5	0.5–5.5	0.5–3.5	
How much do you usually lose in the last 2 months before competitions (kg)?								
Mean ± *SD* (%)	3.1 ± 2.2	2.3 ± 2	2.5 ± 0.5	2.2 ± 2.9	1.8 ± 1.5	1.9 ± 1.6	2.4 ± 1.7	3.5
Range (%)	0.5–5.5	0.5–7.5	0.5–7.5	0.5–5.5	0.5–5.5	0.5–5.5	0.5–5.5	
How much do you usually regain in the week after competition (kg)?								
Mean ± *SD* (%)	1.5 ± 0.3	2.4 ± 1.2	2.5 ± 1.4	4.2 ± 2.9	1.4 ± 0.7	1.7 ± 1	2 ± 1	1
Range (%)	1–2	0–5	1.5–5	2–7.5	0–2.5	0–4	1–4	

Note. OWL = Olympic weightlifting.

et al., 2012; Hillier et al., 2019; King et al., 2023; Kwan & Helms, 2022; Matthews et al., 2019; Nolan et al., 2022; Park et al., 2019; Reale et al., 2018). Usual BM loss (2%–3%) achieved in the week before competition is similar to that identified in other weight-category sports with a shorter post weigh-in recovery period (<3 hr; Campbell et al., 2023; Reale et al., 2018). Athletes used a combination of both CWL and AWL strategies, with gradual dieting, fluid restriction, and low food weight/high-calorie options being the most commonly used strategies. Sex differences were noted for gradual dieting, fasting, and increase in exercise. Lower caliber athletes were more likely to use AWL practices (sauna, spitting, low fiber diets) to make weight. These practices did not vary by weight category.

Although the majority of OWL athletes acknowledged the use of AWL strategies, especially those promoting loss of TBW, the BM reductions were similar to those potentially achieved during a normal training session (Gee et al., 2023; Keogh et al., 2007; Serrano et al., 2019). Typical BM loss observed in the week prior to competition aligns with current American College of Sports Medicine guidelines (<3% of total BM; Burke et al., 2021). However, outliers were evident, with a small number of athletes reporting typical losses of up to 8% of BM in the week prior to competition, similar to typical losses identified in combat athletes (Morton et al., 2010; Reale et al., 2018). Adverse health outcomes have been identified in combat sports athletes undertaking similar amounts of AWL (Franchini et al., 2012; Kasper et al., 2019). Athletes with a short post weigh-in recovery period (≤3 hr) have been advised against AWL of greater than 5% of total BM (Burke et al., 2021), presumably due to potential adverse effects on health and performance. However, without an understanding of an athletes'

Table 2 Caliber of Olympic Weightlifting Athletes Who Completed the Questionnaire

Caliber[a]	Male, $n = 55$ (%)	Female, $n = 94$ (%)
Tier 5	0 (0)	3 (3)
Tier 4	8 (15)	4 (3)
Tier 3	13 (24)	24 (26)
Tier 2*	28 (51)	38 (40)
Tier 1*	6 (11)	25 (27)

[a](McKay et al., 2022) Tier 5: world class; Tier 4: elite/international level; Tier 3: national level; Tier 2: trained/developmental; and Tier 1: recreationally active. *All $p \geq .05$.

Table 3 Rationale for Olympic Weightlifting Athletes Competing in a Different Weight Category Than Their Usual Weight Category ($n = 68$)

Reasons	Female (%)	Male (%)
Did not need to make weight for that competition	24	19
It was too difficult to make weight for that competition	28	5
Wanted to be more competitive in a different weight category	12	9
Wanted to increase/decrease lean mass/fat mass into the next body weight category	7	10
To qualify for states/nationals/international competitions	7	6
Returning to sport from injury	6	4
No longer competitive in the weight category	3	2
Lack of understanding on how to make weight into a different category	2	0
Other[a]	16	9

[a]Health reasons, increase in height.

Table 4 Frequency Analysis of the Persons/Sources Who Are Influential on the Weight Management Behaviors Reported by Participants in OWL

	Male, $n = 42$			Female, $n = 69$		
Person/source	Not influential	A little influential	Highly influential	Not influential	A little influential	Highly influential
Dietitian/nutritionist	23	4	14	20	10	40*
OWL coach	19	11	12	22	26	20
PT/other coach	30	10	2	43	15	7
Internet	29	8	3	48	16	3
Journal articles/textbooks	28	8	5	45	18	6
Social media	31	7	1	55	10	3
OWL/training partner	28	8	4	44	16	8
Doctor	37	1	1	64	3	1
Parents/partner	37	2	2	64	3	2
Other: Self-trial and error			3			4

Note. For analysis, nutritionist ($n = 2$) was collapsed into dietitian; partner ($n = 1$) was collapsed into parents. PT = personal trainer; OWL = Olympic weightlifting. *$p = .006$; $r = .019$.

Table 5 Frequency Analysis of Self-Reported Methods of Body Mass Loss and Time Frame of Use Among Female Athletes ($n = 69$)

Weight loss methods	Never used	I do not use anymore	<1 day	<2 days	<3 days	<4 days	<1 week	<2 week	<3 weeks	<4 weeks	>4 weeks
Chronic weight loss											
Gradual dieting	4	8	1			4	5	10	5	14	18
Increase exercise	31	6		1	1	2	12	2	3	6	5
Acute gut content manipulation											
Skipping 1–2 meals	39	10	8	6	2			3			1
Low fiber	42	4	5	6	5	4	3				
Low wt/high calorie[a]	32	1	15	6	3	2	7	2			1
Laxatives	57	6	1	2			3				
Acute total body water manipulation											
Restrict fluid	12	8	40	7		1	1				
Hot baths	38	5	15	5	1	1	3				
Saunas	33	5	14	7	2		6	1		1	
Heated rooms	62	3	1	1		1	1				
Water loading	33	12	2	2	2	8	9			1	
Low carbohydrate diet	27	7	4	5	4	6	13	1		1	1
Low salt	33	4	3	6	4	3	16				1
Wearing rubber suits	67	1	1								
Spitting	55	4	10								
Other											
Fasting	43	11	7	4		1	1	2			
Diuretics	66	2		1							
Diet pills	69										
Fat burners	63	5									1
Vomiting	67	2									

[a]Low-weight/high-calorie option.

Table 6 Frequency Analysis of Self-Reported Methods of Body Mass Loss and Time Frame of Use Among Male Athletes ($n = 42$)

Weight loss methods	Never used	I do not use anymore	<1 day	<2 days	<3 days	<4 days	<1 week	<2 week	<3 weeks	<4 weeks	>4 weeks
Chronic weight loss											
Gradual dieting	9	3			1		3	7	5	7	7
Increase exercise	27	3	1				1	3	2	3	2
Acute gut content manipulation											
Skipping 1–2 meals	19	5	6	2	2	1	3	1		1	2
Low fiber	30		2	4	3	1	2				
Low wt/high calorie[a]	19		11	3	4		2	1		1	1
Laxatives	36	1	4		1						
Acute total body water manipulation											
Restrict fluid	8	3	24	6			1				
Hot baths	20	9	8				1			1	3
Saunas	19	8	8	1		2				1	3
Heated rooms	34	5	2	1							
Water loading	20	7	2	4	3	1	5				
Low carbohydrate	19	3	2	4	3	2	6	1		1	1
Low salt	23		4	5	2	2	3	3			
Wearing rubber suits	36	4	1					1			
Spitting	34	4	4								
Other											
Fasting	19	6	10	1	1		2			1	2
Diuretics	37	3	1	1							
Diet pills	41	1									
Fat burners	41	1									
Vomiting	41	1									

[a]Low food weight/high-calorie food option.

postweigh-in recovery practices, it is difficult to pass comment on the potential performance implications, warranting further investigation in OWL athletes.

Manipulation of TBW is common among weight-category sport athletes given that it has the capacity for large and rapid fluctuations that directly impact BM (Sawka et al., 2005). The reliance on fluid restriction observed in OWL athletes (Durguerian et al., 2016; Gee et al., 2023) is similar to reports in other weight-category sports (Anyzewska et al., 2018; Brito et al., 2012; Connor & Egan, 2019; Gee et al., 2023; Matthews et al., 2019; Park et al., 2019; Reale et al., 2018). Although the majority of combat sport athletes (Reale et al., 2018) undertake additional exercise to facilitate AWL, a minority of OWL athletes engaged in additional exercise (Tables 5 and 6), similar to reports in powerlifting (Campbell et al., 2023; Kwan & Helms, 2022; Nolan et al., 2022). Interestingly, a similar proportion of OWL athletes used passive sweating (saunas and hot baths) to reduce TBW. The limited use of aerobic training in OWL (King et al., 2023) may likely influence the preference for passive techniques. Passive sweat loss may have greater deleterious impact on physiological and psychological function (altered mood states; Barley et al., 2018; Benton, 2011; Durguerian et al., 2016) and performance, posing a more serious recovery challenge (Barley et al., 2018). Indeed, passive sweating techniques have been shown to increase the risk of heat-related illnesses, especially in athletes who have a brief recovery period (less than 3 hr) and lose more than 3% of total BM (Barley et al., 2019).

Manipulation of gastrointestinal (GI) content is another common AWL strategy used among athletes in weight-category sports (Brito et al., 2012; da Silva Santos et al., 2016; Nolan et al., 2022; Reale et al., 2017). Approximately one third of OWL athletes manipulated their GI contents to promote BM loss, a practice that is more prevalent among combat (Reale et al., 2018) and powerlifting athletes (Nolan et al., 2022). A small proportion (10%) of OWL athletes resorted to laxatives to alter GI contents in the day prior to competition, similar to previous reports in combat sports (Artioli et al., 2010; Filaire et al., 2007) and recent OWL literature (Gee et al., 2023). Although laxatives can efficiently clear fecal matter, they can adversely influence exercise capacity (Holte et al., 2004). A low-fiber diet (<10 g of fiber over 5–7 days) can also be effective in clearing GI contents and has been linked to an estimated 0.7% decrease in total BM (Foo et al., 2022). Given its ability for repeatable use, with no apparent adverse performance implications and only minimal physiological disturbances (decreased satiety; Foo et al., 2022), a low-fiber diet is potentially a BM management strategy that could be considered by more OWL athletes.

OWL athletes utilize gradual dieting as a means of making weight, similar to results observed in athletes in combat (Reale et al., 2018) and strength-based sports (Campbell et al., 2023; King et al., 2023; Kwan & Helms, 2022; Nolan et al., 2022). Gradual dieting involves a systematic reduction in energy intake over an extended time period and is often complemented by an increase in exercise to promote steady weight loss while preserving muscle mass and avoiding metabolic disruptions (Mountjoy et al., 2023). Energy expenditure inherent to OWL training is similar to that in powerlifting but likely less intensive than in endurance and combat sports (King et al., 2023). Although these strategies may reduce the immediate physiological stressors of AWL, if not managed appropriately, they could result in low energy availability and associated adverse health (Mountjoy et al., 2018) and performance implications related to relative energy deficiency in sport (Benton, 2011; Kasper et al., 2019; Mountjoy et al., 2023). The majority of research addresses the prevalence, magnitude, and performance implications of AWL strategies among athletes (da Silva Santos et al., 2016; Kasper et al., 2019), but few address the impacts of CWL in weight-category sports (Langan-Evans, Germaine, et al., 2021; Mountjoy et al., 2023). Further research into the methods and impact of gradual dieting among OWL athletes is warranted, including the risk of low energy availability and subsequent relative energy deficiency in sport.

Male OWL athletes did not identify preference for any one source of influence over their BM management practices, which contrasts with combat athletes, for whom coaches and training partners have been consistently identified as influential (Campbell et al., 2023; Connor & Egan, 2019; Kwan & Helms, 2022; Nolan et al., 2022; Reale et al., 2018). This may stem from former athletes transitioning into coaching roles, perpetuating preexisting cultural attitudes within weight-category sports (Brown et al., 2012; Filaire et al., 2007; Purcell et al., 2022; Reale et al., 2018). Interestingly, female OWL athletes highlighted dietitians/nutritionists as very influential, indicating that evidence-based advice regarding BM management practices is deemed as impactful. Female OWL athletes were more likely to focus on CWL, utilizing gradual dieting, with less reliance on AWL strategies, including fasting and increased exercise. This variation in preference could be indicative of wider sex-based differences in dietary habits and approaches (Brown et al., 2012; Grzymislawska et al., 2020). Indeed, females often place a greater emphasis on nutrition and actively managing their BM, likely influenced by societal expectations that prioritize appearance and body image (Brown et al., 2012; Grzymislawska et al., 2020). The existing body of research is yet to feature sex-based interventions within weight-category sports (Langan-Evans, Reale, et al., 2021).

Limitations

This study used a BM management questionnaire for which construct validity was recommended during data capture (Cox et al., 2024), possibly by capturing biochemical measures to confirm the athlete's hydration and energy status. Unfortunately, this was deemed too intrusive and costly to implement directly prior to competition. In hindsight, incorporating a rapid weight loss score (Artioli et al., 2010) to measure the "intensity of application" for each AWL and CWL strategy may have been beneficial. Such a scale would offer a means of facilitating a more straightforward comparison with other studies (Artioli et al., 2010; Berkovich et al., 2019; Nolan et al., 2022; Reale et al., 2017). It is recognized that self-reported data can be susceptible to recall bias (Althubaiti, 2016). Measures were taken to mitigate this by validating the questionnaire specifically for OWL athletes, specifying time frames, avoiding leading questions, and utilizing the imminent OWL competition to enhance recall (Althubaiti, 2016). It should be noted that only a third of the OWL athletes surveyed in this study compete at a national or international level. This underrepresentation could potentially skew the observed relationships between athlete caliber and weight loss methods. Thus, the impact of athlete caliber on BM management practices in OWL warrants further exploration, especially in international competitions.

Conclusion

This research offers new insights into the BM management practices of OWL athletes, identifying that the majority (76%) of

athletes compete at a BM lighter than their habitual training weight. The prevalence and magnitude of weight loss (2%–3%) achieved in the week before competition are trends consistent across sex, athlete caliber, and weight category. Athletes use a combination of both CWL and AWL strategies, with gradual dieting, fluid restriction, and low food weight/high-calorie options being the most commonly used strategies. Lower caliber athletes were more likely to use AWL practices (sauna, spitting, low fiber diets) to make weight. Whereas male athletes acknowledged a wide-ranging impact from various influences on their BM management practices, females sought guidance from dietitians/nutritionists, which may reflect sex differences in dietary habits and approaches. This may be important to consider in any subsequent interventions used to influence an athlete's BM management practices. Further research into the recovery practices of athletes following weigh-in is warranted and should be complemented by an exploration of the performance implications of OWL athletes' BM management practices.

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