

[Primary Care]

Weight Management in Amateur Wrestling

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Context: Unhealthy weight loss practices continue to plague amateur wrestling. The National Collegiate Athletic Association weight loss guidelines are beneficial but have not solved the problem.

Evidence Acquisition: All relevant databases through 2008 were searched using PubMed. The references of relevant articles were then searched for additional publications.

Study Type: Clinical review.

Results: New rules approved by the National Collegiate Athletic Association have been implemented in an attempt to prevent drastic weight loss practices in wrestlers. Although some are effective, such as establishing a minimum wrestling weight and decreasing the period between weigh-ins and actual wrestling, unsafe weight loss practices still occur.

Conclusion: The attempts made by the National Collegiate Athletic Association to prevent drastic weight loss in wrestling have been effective to some degree. The mind-set of athletes, coaches, and clinicians needs to change if further improvements are to be made.

Keywords: wrestling; weight management; weight cutting; guidelines; weight loss

Coaches and wrestlers often believe that the best wrestling weight is below preseason weight to achieve a competitive advantage.^{6,12} To compete at the lowest possible weight class, wrestlers have been known to use unsafe practices leading up to a competition, including excessive vigorous exercise, fluid restriction, vapor-impermeable suits, and hot environments (eg, sauna), in addition to laxatives, emetics, diuretics, and self-induced vomiting.^{6,12,18} Unfortunately, such practices can have a negative impact on cardiovascular function, thermal regulation, renal function, electrolyte balance, body composition, muscular endurance, and strength.^{6,17,19}

Collegiate wrestlers regularly used dangerous weight-cutting practices before 1997, when the National Collegiate Athletic Association (NCAA) changed the rules for weight management following the deaths of 3 healthy collegiate wrestlers.^{2,9,14} Occurring within 35 days of one another, these deaths were the result of dangerous weight-cutting practices.² All 3 athletes had relied on similar methods for rapid weight loss, which promoted dehydration through perspiration. In addition to severely restricting food and liquid intake, the athletes increased their water loss with the use of vapor-impermeable suits while

wrestling or working out in heated environments.² In all 3 cases, this led to multiorgan failure.^{2,8,17}

As a result of these deaths, the NCAA developed new rules, guided by the following 3 principles:

1. Eliminate weight management practices that could have an adverse impact on the health of the athlete. To ensure compliance, the incentive for unhealthy weight management practices must be minimized.
2. The competition itself should be the focus of the sport, not weight control.
3. The new rules should be practical, effective, and enforceable.⁹

The new rules¹⁰ prohibit the following unsafe practices: use of vapor-impermeable suits and similar devices, saunas, hot boxes, steam rooms, laxatives, emetics, excessive food and fluid restriction, self-induced vomiting, diuretics, use of any artificial means of rehydration, and wrestling room temperatures higher than 80°. Also, an initial weight assessment must be performed for each wrestler between the first day of classes and

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the first official practice, at which time the wrestler's minimum wrestling weight (MWW) for that year of competition must be determined.¹⁰

The MWW is based on the lowest allowable body fat percentage (5%) and the amount of safe weight loss possible between the first weigh-in and the first meet—namely, losing no more than 1.5% of body weight per week.¹⁰ These measures ensure that the projected weight does not put the wrestler below 5% body fat and that it is appropriate for the period before the first meet. The MWW is individualized for all wrestlers, taking into account measurable standards. By taking into account body fat, weight, hydration status, and a healthy weight loss, wrestlers are discouraged from trying to wrestle competitively at an unreasonable weight.¹⁰ In addition, during the initial weight assessment, when the MWW is determined, the specific gravity of urine must be less than 1.020, indicating adequate hydration.¹⁰

The normal specific gravity of urine falls between 1.002 (very hydrated) to 1.030 (dehydrated), with 1.020 representing normal hydration.^{4,9,20} If the specific gravity is above 1.020, the wrestler cannot continue with the initial assessment for MWW because of dehydration. The wrestler must wait a 24-hour period before the process can be repeated.¹⁰ Once the MWW has been determined, a wrestler's weight class is established at the first weigh-in of the season. The weigh-in process now occurs 2 hours before competition for multiple-day tournaments, 1 hour before the start on subsequent days, and 1 hour before single-day tournaments and dual meets. A 1-lb (0.45-kg) weight allowance for every additional day of the tournament encourages adequate hydration and nutrition needed for endurance.¹⁰

Before these rule changes, wrestlers weighed in the day before tournaments and up to 5 hours before dual meets, thereby allowing a significant amount of time for rehydration and recovery. Currently, this tighter weigh-in schedule reduces the time available to rehydrate between weigh-in and competition and therefore discourages drastic weight loss practices. Similarly, the order of weight class competition is now randomly determined to discourage higher weight classes from losing more weight while expecting more time before competition.¹⁰ Many components of the new policy have been successful in discouraging drastic weight loss measures.

CONTINUING CONCERNS

MWW is based on the athlete losing no more than 1.5% body weight per week,¹⁰ and this criterion is based on reasonable weekly expectations.⁷ If an average person loses more weight than this per week, even with severe reduction in calories, water and muscle will be lost, not body fat, thus leading to a loss of strength.⁷ Unfortunately, no method of monitoring can ensure that no more than 1.5% body weight is lost per week. Also, wrestlers may still resort to unhealthy weight loss practices before the start of the season. To address this concern, the NCAA does provide voluntary individualized weight loss plans for each athlete, to encourage safe nutritional practices.

However, establishing the MWW and providing individual weight loss plans does not stop large fluctuations in weight from week to week while the wrestler is in season. Although monitoring daily weight is an onerous task, careful daily assessment by the coaching and training staff may be the only way to ensure compliance. For instance, wrestlers may be suffering from a form of bulimia during many of these uneducated attempts to control their weight.¹³ Oppliger et al¹³ assessed 713 high school wrestlers on weight loss practices, nutritional knowledge, and bulimic behaviors and found that 1.7% met all the criteria necessary for the diagnosis of bulimia nervosa, a higher percentage than expected from male athletes in this age group.

For the preseason weigh-in, body fat measurements are critically important. The NCAA accepts body fat measures using the skinfold test, hydrostatic weighing, and BOD POD analysis.¹⁰ These results determine body density on the basis of volume and mass, and they predict percentage of body fat (Siri equation).¹⁰ Brown et al¹ compared these 3 body fat measurement methods in high school wrestlers, finding all 3 comparable. However, there is substantial room for human error, particularly with skinfold testing.³ Unfortunately, due to practical reasons, the skinfold method is the most commonly used for body fat assessment and may reflect inaccurate calculations. The process of skinfold assessment requires significant experience and skill to obtain an accurate body fat percentage. With lean athletes, a small margin of error could result in a wrong decision for the wrestler.

Last, there is potential for conflict of interest among those responsible for monitoring these safety processes. Athletes, athletic trainers, and coaches share a delicate relationship, and the NCAA guidelines do not provide guidance to safeguard against these conflicts. The 2008 version requires that the assessor be a member of the sports medicine staff; this person also determines the MWW with the coach.¹¹ As a result, athletic trainers are often placed in a difficult situation, trying to maintain a delicate balance between being health advocates for the athletes and maintaining a working relationship with the coach. As with NCAA drug testing, delegated officials from outside the athletic departments would be a wise choice in assessing the MWWs of athletes. This would remove (1) the athletic trainers from the uncomfortable position of assessing eligibility and (2) the obvious conflict of interest with the coaching staff.

RECOMMENDATIONS ON SAFE WEIGHT MANAGEMENT

Although unsafe weight-cutting practices in wrestling resulted in the death of 3 college athletes,² wrestlers do have safe methods to manage their weight and maximize their competitive fitness. Attempting to lose weight quickly is never safe; it can result in severe water loss, dehydration, and, ultimately, death.² Gradual weight loss is preferable, particularly in athletes who must maintain their lean body mass.^{21,22} In addition, wrestlers should avoid inducing large fluctuations in their weight throughout the year; maintaining their weight at a more constant level would be ideal.^{19,21} Because weight control is so



Clinical Recommendations

SORT: Strength of Recommendation Taxonomy

A: consistent, good-quality patient-oriented evidence

B: inconsistent or limited-quality patient-oriented evidence

C: consensus, disease-oriented evidence, usual practice, expert opinion, or case series

Clinical Recommendation	SORT Evidence Rating
Adequate calorie consumption and a balanced nutritious diet are important for maintaining sufficient muscular strength and power. ¹⁶	B
Gradual weight loss is preferable, particularly in athletes who must maintain their lean body mass. ^{21,22}	C
Avoiding large fluctuations in weight throughout the year would be ideal for wrestlers; they should maintain their weight at a more constant level. ^{19,21}	C

For more information about the SORT evidence rating system, see www.aafp.org/afpsort.xml and Ebell MH, Siwek J, Weiss BD, et al. Strength of Recommendation Taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. *Am Fam Physician*. 2004;69:549-557.

critical to the sport of wrestling, nutrition education—and, in some cases, counseling—is no doubt needed. Adequate calorie consumption, a balanced nutritious diet, and the role of hydration are all fundamental to the success of these programs. Counseling may help overcome the distorted weight loss mind-set associated with wrestling and establish healthy nutritious eating habits for the future.

FUTURE DIRECTIONS AND SUGGESTIONS

The NCAA has improved weight management for wrestlers with the addition of new regulations.⁹ However, some additional changes may be indicated. Scheduling weigh-in times even closer to the start of multiple-day tournaments and randomly determining which weight class will start the tournament may further discourage rapid weight-cutting techniques.

Instilling good weight control habits is necessary before collegiate wrestlers begin to compete, to improve their health environment. The National Federation of State High School Associations, a governing body for high school athletics, developed a protocol for making weight in wrestling for the 2006–2007 season.⁵ Its purpose was to discourage drastic measures to rapidly drop weight. The focus of the protocol was to shift emphasis from weight loss to wrestling skills.⁵ Most schools within the association have involved their athletic trainers in the weight management procedures—namely, as an attempt to ensure that safe measures are being used to lose weight. During the weight certification process, wrestlers are required to have a satisfactory specific gravity of urine (no more than 1.025). Body fat is determined before the first match of the season. The minimal acceptable level of body fat is 7% for boys and 12% for girls.^{5,15} In addition, weight loss is not to exceed 1.5% of body weight per week, as with collegiate wrestlers.⁵ The regulations require a third party to monitor the weight certification process to avoid conflicts of interest.

The impact of food restriction in wrestlers has been studied in terms of strength, growth, and maturation. Adolescent wrestlers have had reduced levels of prealbumin, an indication of protein deficiency.¹⁶ Reduced muscle performance

has been seen with lower prealbumin levels, as compared to those of athletic male adolescents on an adequate diet. Muscle strength does return following implementation of an adequate diet.¹⁶

CONCLUSION

Wrestling is a sport that often begins at an early age in many programs throughout the country. Unfortunately, there is no national governing body overseeing the health practices of these programs, including weight management. Because of this deficiency, many wrestlers adopt unsafe practices at a young age, a pattern that may persist through high school and into college. The thought processes of coaches and the understanding of wrestlers need to improve regarding health and weight management. An unhealthy atmosphere continues to surround wrestling governing bodies, coaches, athletic trainers, and athletes. To establish safe weight management practices in wrestling, the mind-set must be refocused on developing skills and strength to be successful, not relying on weight loss.

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