12-1-2020

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Publication Info

Published in *Journal of Athletic Training*, Volume 56, Issue 1, 2020, pages 64-70.

Journal of Athletic Training 2021;56(1):64–70
doi: 10.4085/1062-6050-0373.19

www.natajournals.org

Practices of Athletic Trainers Using Weight Charts to Determine Hydration Status and Fluid-Intervention Strategies

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Context: Determining an athlete's hydration status allows hydration-related concerns to be identified before significant medical or performance concerns arise. Weight charts are an accurate measure of hydration status changes, yet their clinical use by athletic trainers (ATs) is unknown.

Objective: To investigate ATs' use of weight charts in athletic settings and describe their subsequent clinical decisions.

Design: Cross-sectional survey.

Setting: High schools and National Collegiate Athletic Association Divisions I, II, III and National Association Intercollegiate Athletics colleges.

Patients or Other Participants: A total of 354 ATs (men = 162, women = 175; 17 respondents did not answer the demographic questions) responded across athletic settings (Division I [45.7%]; Division II, Division III, National Association Intercollegiate Athletics combined [n = 19.9%]; and high school [34.4%]).

Main Outcome Measure(s): The 26-question online survey was developed by content experts and pilot tested before data collection. Participants answered questions focused on weight-chart use (implementation, timing, and calculations) and clinical decision processes (policies, interventions, and referral). Frequency statistics were calculated.

Results: The majority of ATs (57.2%) did not use weight charts. Of those who did, most (76.0%) used charts with football, soccer (28%), and wrestling (6%) athletes. They calculated changes as either an absolute (42.2%) or percentage (36.7%) change from prepractice to postpractice; only 11.7% used a baseline weight for calculations. Of those who used the percentage change in body mass, 66.0% selected a threshold of –3% to –4% for an intervention. Most ATs (97.0%) intervened with verbal education, whereas only one-third (37.0%) provided specific fluid amounts based on body mass changes.

Conclusions: Typically, ATs in athletic settings did not use weight charts. They considered a body mass change of –3% the indication for intervention but did not specify rehydration amounts for hypohydrated athletes. Educational workshops or technology applications could be developed to encourage ATs to use weight charts and calculate appropriate individual fluid interventions for their athletes.

Key Words: hypohydration, hyperhydration, heat illness prevention, body mass changes

Key Points

- Athletic trainers in sports settings did not commonly use weight charts as the basis for clinical decision making regarding hydration.
- Of those who did use weight charts, the primary focus was body mass changes during practice for the first 3 weeks of preseason football.
- Athletic trainers should develop policies for using weight charts to help prevent hypohydration and hyperhydration in athletes.

Expert consensus and position statements provide recommendations for fluid replacement in athletes with hypohydration and referral for those with significant hyperhydration that are predominately based on body mass changes.[1,2] In addition, these documents advocate for policies and procedures to be established before athletic seasons begin to aid in clinical decisions and advise that fluid interventions or referral be individualized based on body mass changes in conjunction with other factors.[3]

Tracking hydration changes in athletes is essential for maintaining performance and preventing exertional heat illnesses. Hypohydration of as little as 2% can result in performance decrements,[4,5–9] and $\geq$3% hypohydration can cause cardiovascular impairments and thermoregulation disturbances.[9,10] Hypohydration predisposes athletes to heat exhaustion, heat syncope, and exertional heat stroke,[11] whereas hyperhydration is a precursor to hyponatremia.[12] To restore euhydration, experts recommend replacing 100% to 150% of fluids lost during exercise within 2 to 4 hours postactivity.[13–15] Hydration assessment can be used by athletic trainers (ATs) to determine if an intervention strategy is warranted and, if so, to guide rehydration recommendations. Commonly used hydration status biomarkers are plasma osmolality, urine specific gravity, and body mass changes.[16] Of these measures, body mass changes are anecdotally used the most often by ATs due to their low cost and easy assessment in the athletic setting. However, the actual use of body mass changes and weight charts for guiding clinical decisions is unknown in the athletic training literature.

Experts commonly endorse the use of weight charts in various clinical athletic settings, but if and how they are used has never been established. Ascertaining the current prevalence of use and implementation will help us to develop educational courses and more detailed future recommendations. Therefore, our research aims were to (1) identify the percentage of ATs who used weight charts in the athletic setting, (2) characterize implementation strategies and derived outcomes of weight charts, (3) describe postevent fluid-intervention strategies based on weight chart results, and (4) determine if differences exist between clinical settings.

METHODS

Design

A quantitative survey design was applied to meet the 4 research aims. The independent variable was clinical setting, with 3 levels: high school (HS), National Collegiate Athletic Association (NCAA) Division I, and small college (SC; NCAA Divisions II and III and National Association Intercollegiate Athletics [NAIA] combined post hoc). Variables of interest were weight chart use and postevent (ie, practices, games) fluid-intervention strategies.

Participants

Athletic trainers in the HS; NCAA Divisions I, II, and III; and NAIA settings were recruited from a randomized list of 1000 email addresses created by the National Athletic Trainers' Association (NATA) Member Services Department and a social media campaign. Participants included both staff and graduate assistant ATs. Job title and clinical setting were the only inclusion criteria. The university institutional review board approved the study before data collection began. Each participant provided informed consent by reading the purpose and study description on the survey's first page and proceeding to the first question.

Measurements and Instrumentation

Our 26-question quantitative survey was housed on a password-protected online site (SurveyMonkey, San Mateo, CA). The survey was divided into 3 sections: demographics, current weight chart practices, and postevent fluid-intervention strategies (Supplemental Table). Face and content validity were established by a panel of experts (2 academic specialists [15 years each of hydration research] and 1 clinical content specialist [15 years as a staff AT with Division I Southeastern Conference football]). The content panel met in person and online to determine which elements composed weight charts (units of measure, baseline weight, use timeframe, etc) via verbal consensus. The academic experts and principal investigator (J.M.E.) reviewed research and consensus statements before and after this meeting to ensure that all elements involved in the use of body mass changes for assessing hydration status were included in the survey.[1,3,5,11,17–22] Questions were developed that asked the AT to report his or her current practice for each implementation element. The panel members added and revised the survey until they agreed that the survey contained all of the implementation elements. A pilot study of 44 graduate assistant ATs and 13 full-time ATs was then completed (data not included in the analysis). These ATs worked in a variety of clinical athletic settings and with various sports. The expert panel revised the survey based on the ATs' feedback to improve question clarity in order to obtain the desired data for each implementation element.

Demographic Section. For descriptive purposes only, demographic questions addressed age, sex, number of years as an AT, current job title, and highest level of education completed. Respondents were also asked for the numbers of HS student aides (if applicable), Commission on Accreditation of Athletic Training Education–accredited athletic training students in their programs, and other ATs working with the same sport.

Current Practices Using Weight Charts. Participants were asked whether they used a weight chart to assess hydration status and, if so, with which sport teams. Logistical questions included the length of time during the season the AT used a weight chart, at what point during the season he or she began using a weight chart, the medium (computer document versus wall chart) used to document weights, and who was responsible for calculating hydration changes. Additional items focused on the use of the athlete's baseline weight in calculations. A respondent who answered *no* to using a weight chart was directed to a different set of follow-up questions exploring the reasons why.

Postevent Fluid-Intervention Strategies. The existence of protocols and policies for fluid intervention and the clinical value threshold used to decide if an athlete required a fluid intervention were also investigated. Questions asked about the specific fluid-intervention strategies used, with whom the AT shared body mass change information, and referral methods for a hypohydrated athlete. All respondents, even those who did not use weight charts, were guided to this section.

Procedures

The survey link and invitation to participate were e-mailed to potential recruits through NATA Member Services. After 1 month, we added a convenience sample by emailing colleagues with connections to HS and Division II and III ATs and a social media campaign to gather more responses for those clinical site categories. This convenience sample was assembled in a 2-week timeframe. Participants gave consent at the beginning of the survey and completed the instrument in 1 sitting.

Statistical Analysis

We calculated frequencies of responses for each question. Cross-tabulation with contingency table analysis determined if differences existed between clinical settings (HS, Division I, and SC) for select items. Adjusted residuals were analyzed post hoc to identify which cells deviated from independence. We used SPSS (version 25; IBM Corp, Armonk, NY) for the analyses and set α at .05 a priori. Bonferroni adjustments were conducted on the post hoc analyses.

Table 1. Participant Demographics Across Clinical Settings

Characteristic	Clinical Setting: High School	Division I[a]	Small College[b]
Age, y (mean ± SD)	31 ± 10	30 ± 8	33 ± 10
Sex, %			
Male	46	52	46
Female	54	48	54
Position, %			
Head AT	68	7	30
Assistant AT	16	69	57
Graduate assistant or intern	16	25	13
Experience, y (%)			
0–2	24	19	13
3–5	26	34	28
6–20	40	38	39
21–40	10	8	18
Degree, %			
Bachelor's	40	19	22
Master's	59	78	78
Support staff, Mean ± SD			
Student aides	4 ± 7	1 ± 3	1 ± 2
Athletic training students	1 ± 5	2 ± 5	3 ± 6
Staff certified ATs	2 ± 1	2 ± 1	1 ± 1

Abbreviation: AT, athletic trainer.

[a] National Collegiate Athletic Association.

[b] National Collegiate Athletic Association Divisions II and III and National Association of Intercollegiate Athletics.

Table 2. Use of Weight Charts by Athletic Trainers (n = 143)

Implementation Categories	Survey Options	No. (%)
Method	Paper	67 (47.2)
	Computer	27 (19.0)
	Both	48 (33.8)
Start date	Preparticipation physical examination	19 (13.9)
	Preseason: First day	113 (82.5)
	Regular season: First day	5 (3.6)
Length of time	≥1 wk	4 (3.2)
	2–3 wk	77 (60.2)
	1 mo	24 (18.8)
	Entire season	23 (18.0)
Writing or inputting weights	Athletic training student or aide	44 (32.6)
	Athletic trainer	19 (14.1)
	Strength and conditioning coach	15 (11.1)
	Athlete	57 (42.2)
Unit of measurement	lb	137 (99.3)
	kg	1 (0.7)
Person in charge of calculating	Do not calculate	18 (13.8)
	Athletic training student or aide	3 (2.3)
	Athletic trainer	73 (56.2)
	Team coach	8 (6.2)
	Computer	27 (20.8)
	Athlete	1 (0.8)
Calculations	Do not calculate changes	12 (9.4)
	Absolute difference from baseline	5 (3.9)
	Absolute difference pre- to postexercise	54 (42.2)
	Percentage difference from baseline	10 (7.8)
	Percentage difference from pre- to postexercise	47 (36.7)

RESULTS

Participant Demographics

We had a response rate of 25% (250/1000) from the NATA Member listserv. An additional 104 participants composed the convenience sample, for a total of 354 completed surveys. A total of 34.4% (n = 116) of the ATs worked in the HS setting, 45.7% (n = 154) in Division I, and 19.9% (n = 67) in the SC setting. Ages ranged from 21 to 70 years. Detailed demographic information appears in Table 1.

Current Practices Using Weight Charts

The majority (57.2%, n = 191/334) of ATs did not use weight charts to measure changes in athletes' hydration status. Barriers were available time (17.7%, n = 34/192), accessible space (5.7%, n = 11/192), administrative help (11.9%, n = 23/192), or a combination (64.6%, n = 124/192). Of those who did not use weight charts, the majority (67.7%, n = 126/186) relied on athlete education and self-monitored urine color. Among those who used weight charts, 76% (n = 108/142) applied them to football, 28% (n = 41/142) to soccer, and 6% (n = 9/142) to wrestling. The use of weight charts did not differ by clinical setting ($\chi^2_2 = 4.25$, $P = .119$).

The implementation logistics of the ATs who used weight charts to determine hydration status are described in Table 2. Of the 60.9% (n = 81/133) of ATs who used a baseline weight, 27.8% (n = 37/133) took the weight at the first preseason practice. However, 83.1% (n = 69/83) did not verify if the athlete was hydrated at the time the baseline weight was measured. Only 7.2% (n = 6/83) used urine specific gravity to confirm hydration status. Of the ATs who used baseline weights, 74.0% (n = 54/73) did not recalculate the athlete's baseline weight, and 11.0% (n = 8/73) remeasured 5 days later. After Bonferroni adjustments, no differences were apparent between clinical settings for use of a baseline measure ($\chi^2_2 = 8.70$, $P = .191$) or verification of baseline weight ($\chi^2_2 = 3.03$, $P = .805$). Initial analysis indicated differences between clinical settings for use of the chart method ($\chi^2_2 = 18.05$, $P = .001$) or length of time used ($\chi^2_2 = 31.11$, $P = .001$). However, adjusted residuals showed that no value deviated from independence ($P > .05$).

Postevent Fluid-Intervention Strategies

Overall, 56.1% (n = 171/305) of ATs had policies and procedures in place to address hydration status changes via weight charts, with no difference among clinical settings ($\chi^2_2 = 4.77$, $P = .092$). For the ATs who relied on percentage changes in body mass, Figure 1 illustrates the percentages they used to determine if an intervention was needed. The clinical settings did not differ for intervention value ($\chi^2_2 = 22.95$, $P = .115$).

A total of 86.8% (n = 289/333) of ATs intervened via oral educational instructions with set amounts of fluid to consume, and 70.3% (n = 234/333) informed the athletes they were responsible for drinking fluids at home or at the dining facility on their own. One-third (30.0%, n = 100/333) of ATs provided a hydration handout to the athlete. A majority (58.9%, n = 196/333) supplied actual fluids to the

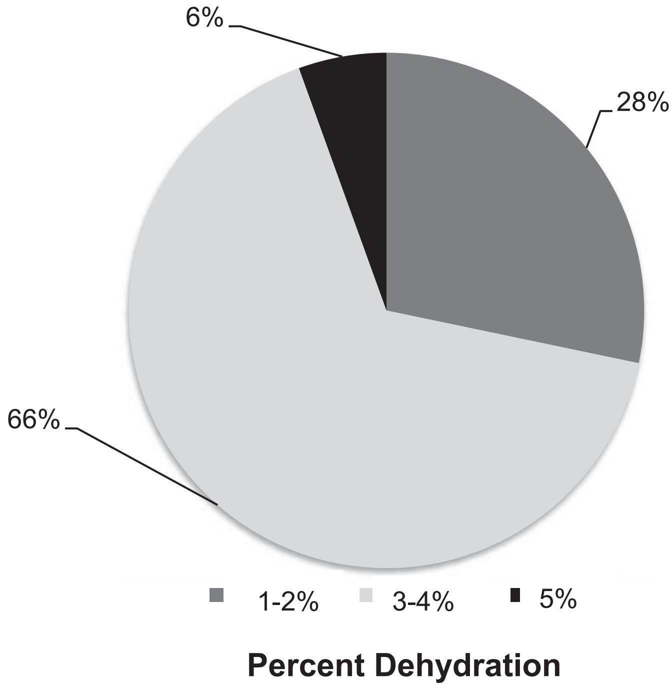

Figure 1. Dehydration percentage thresholds athletic trainers used in making clinical decisions.

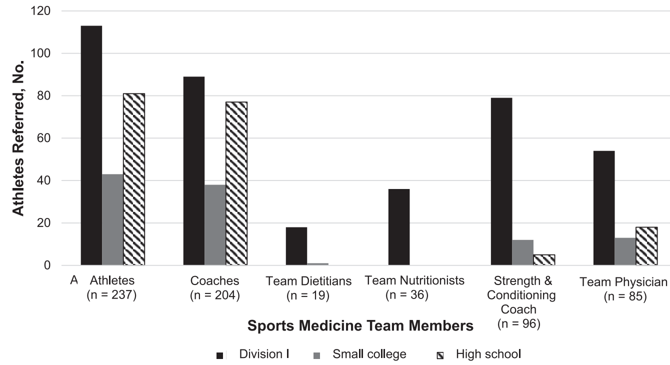

Figure 2. Body mass change information sharing and referral.

athlete as an intervention; ATs in Division I furnished fluids more often than HS and SC ATs ($\chi^2_2 = 16.849$, $P < .001$).

Across settings, most ATs (71.2%, n = 237/333) shared body mass change information with their athletes and 61.0% (n = 203/333) with team coaches (Figure 2). Compared with other settings, more Division I ATs conveyed hydration changes to dietitians ($\chi^2_2 = 19.497$, $P < .001$), strength and conditioning staff ($\chi^2_2 = 75.778$, $P < .001$), and team physicians ($\chi^2_2 = 14.621$, $P < .001$), whereas parental contact was greater in the HS setting ($\chi^2_2 = 103.922$, $P < .001$). The majority of ATs (84.7%, 254/300) did not refer athletes with abnormal weight chart results to another sports medicine team member, and this plan did not differ by clinical setting ($\chi^2_2 = 9.40$, $P = .052$). Those ATs who did refer athletes directed them to the team physician (25%, n = 83/333), nurse (3%, n = 10/333), or dietitian (6%, n = 20/333).

DISCUSSION

The primary purpose of our study was to describe the current culture of weight chart use by ATs in sport settings. We found that more than half of ATs were not using weight charts to identify athletes' changes in hydration status. Those who did consult weight charts implemented them in a variety of ways. When changes in hydration status were demonstrated, policies and interventions were not consistent across ATs.

Participant Demographics

The survey participants represented ages 21 to 60 years and 0 to 40 years of clinical experience. The clinical settings surveyed were HS and all levels of collegiate athletics. Clinician experience ranged from newly certified to more than 20 years of clinical practice. The Division I setting had the largest number of respondents. The majority of ATs were preceptors to athletic training students, student aides, or both and enlisted them to assist with writing or typing body masses into weight charts. However, ATs did not typically ask their students or aides to calculate body mass changes. Relying on help to overcome administrative barriers is especially important for HS ATs because most HSs only employ or contract with 1 AT.[23] Athletic trainers in this setting should discuss with school administrators options for adding additional ATs to improve the care provided. Athletic trainers can also elicit help from the coaching staff.

Current Practices Using Weight Charts

A majority of ATs surveyed did not use weight charts to track hydration changes, even for a short period of time. This practice does not follow the recommendations of the NATA[1] and American College of Sports Medicine[3] position statements, which advise tracking hydration status changes. More concerning was that these respondents did not determine hydration status using any other method, likely leading to unrecognized hypohydration or hyperhydration in some of their athletes. Hydration status can be measured in many ways, but the benefits of using weight charts are that they are noninvasive, field friendly, and quick.[24] Regardless of the environmental conditions and sport setting, weight charts should be used to track hydration changes in all athletes. Additional clinical recommendations for the efficient implementation of weight charts are available in Table 3.

Weight charts were most commonly used for football, soccer, and wrestling athletes. This finding is encouraging, as these athletes are at risk for hypohydration due to the nature of their sports. Given that tracking weight in wrestlers is mandatory for sport participation,[1] it is interesting that more wrestling ATs did not complete the survey. This may have occurred because wrestling ATs use weight charts for verifying competition weight categories rather than hydration purposes.

Also, fewer ATs in female sports reported using weight charts. The athlete's sex should not be a deterrent to tracking hydration with weight charts, as both male and female athletes can have body weight challenges. Sensitivity and confidentiality regarding weight and body image can be concerns when using weight charts; however, steps can be taken to ensure privacy when obtaining an athlete's weight. Scales are available with a screen that can shield

Table 3. Weight Chart Implementation Elements and Corresponding Clinical Recommendations

Implementation Element	Clinical Recommendation
Sport setting	All sports, regardless of season (fall, winter, spring), and out-of-season conditioning sessions should incorporate the use of weight charts to optimize performance and minimize hypohydration or hyperhydration.
Scale	A digital scale, with a screen that is separate from the weighing apparatus, should be used to measure quickly and allow for privacy.
Baseline weight	Three days of hydrated first-morning weights should be averaged for a baseline weight before day 1 of weight chart use. Alternative method: use urine specific gravity to verify the day 1 hydrated weight, which then serves as the baseline weight. Baseline weights should be recalculated or reverified after 5 to 7 d.
Clothing	Only sports bra and shorts (females) and shorts (males) should be worn for weight chart measurements (ie, no shoes, socks, equipment). Athletes should towel sweat off before postexercise measurements.
Privacy	A visual obstacle should be placed so the athlete cannot see the weight recorded by the examiner. A screen can provide a temporary privacy area, so the athlete's body is not visible to others waiting.
Recording weight and calculating hydration changes	Staff athletic trainers, athletic training students, or student aides should record weights before and after activity sessions. Strength and conditioning coaches or other unbiased support staff can also record weights.
Measurement unit	Kilograms should be used for faster fluid-intervention calculations.
Timeframe	Weight charts should be used for the entire season (ie, sport season and conditioning season) to optimize performance and minimize hypohydration or hyperhydration. If this is not possible, weight charts should be used for the first 14 d of warm or hot weather, when the risk of exertional heat illness is highest.

the athlete from viewing the measurement. A clinician can also record weight on a separate piece of paper or in a computer program and share only the hydration change with the athlete, not the absolute value.

Only a very small number of ATs verified that their athletes were hydrated when the baseline weight was recorded. In the absence of an accurate baseline weight, the chart may provide invalid information, as the calculations will be based on an athlete who is perhaps hypohydrated. A valid baseline weight can be ensured in 2 ways. The first option is to record the weight each morning for 3 days.[7] The second option is to use a refractometer (clinical or digital) to measure urine specific gravity at a 1-time convenient weight. If urine specific gravity indicates the athlete is not hydrated (ie, $\geq$1.024),[16] then he or she should return after an appropriate rehydration timeframe to try again.

Another key finding was that most ATs only calculated absolute differences in weight from pre-exercise to postexercise. Absolute calculations are helpful in determining individual rehydration recommendations but do not account for the athlete's size.[7] An offensive lineman who weighs 250 lb (113 kg) and loses 5 lb (2 kg) of water during practice is of much less concern than a cross-country runner who weighs 150 lb (68 kg) and loses 5 lb. Therefore, the percentage change in hydration status provides clinical information on possible risk factors (hypohydration, hyperhydration) and should be considered in developing hydration policies and making return-to-play decisions.[2]

Weight chart calculations with corresponding clinical use recommendations are supplied in Table 4. Using a paper chart is helpful when staffing is minimal and athletes are recording their weights. However, a computer performs the calculations automatically, and clinicians can enact their hydration intervention plans sooner. Across all settings, a variety of individuals were tasked with measuring or recording weights. It is worrisome that, in some instances, athletes who recorded their own weights could fabricate the results if they were afraid of missing practices or games.

Most ATs used weight charts for the first 2 to 3 weeks of their seasons. Ideally, ATs would track athletes' hydration throughout the season for optimal performance, but if that is not possible, tracking the weeks carrying the highest risk for exertional heat illness is beneficial. During the weeks of highest risk (first 2 weeks of warm to hot conditions), appropriate hydration is an efficient prevention technique.[11] Only 1 respondent used kilograms. One kilogram of weight loss equals 1 L of water lost (1 kg = 1 L). When discussing hydration with athletes and implementing fluid-intervention strategies, it is helpful to use kilograms, particularly because the 1-L water bottle is common in athletic settings.

Postevent Fluid-Intervention Strategies

Regardless of clinical setting, the majority of ATs had written policies and procedures in place for identifying a

Table 4. Weight Chart Calculations and Recommendations for Clinical Use

Hydration Change	Calculation	Clinical Use
Within practice or game absolute change	Δ Body mass = pre-event weight $-$ postevent weight	Immediate fluid intervention via oral communication, individualized handout, or electronic message; 1 kg = 1 L or 1 lb = 16 oz of fluid
Within practice or game percentage of dehydration	% Dehydration = [(pre-event weight $-$ postevent weight) /pre-event weight] $\times$ 100	Return-to-play decisions as outlined in policies
Across practice or game percentage of dehydration	% Dehydration = [(baseline weight $-$ postevent weight) /baseline weight] $\times$ 100	Reduction in exertional heat illness risk by using return-to-play decisions as outlined in policies

Table 5. Example of Weight Chart Policy Thresholds

Hydration	Hydration Threshold, %	Policy
Euhydration	−1.9 to +0.9	No intervention needed.
Hypohydration	−2 to −3.0	Use oral, paper handout, or electronic messaging with individualized fluid recommendation based on absolute calculation. Consider further assessment with chronic (multiday) results.
	>−3.1	Withhold from activity until further assessment is completed and weight returns to within 1% of baseline weight.
Hyperhydration	>+1	Further assessment using urine specific gravity and history (recent drinking habits, thirst level, urine frequency). Behavior modification via education with the addition of sodium foods. Withhold from activity if symptoms warrant.

hypohydrated athlete. Yet almost half of ATs lacked such policies and procedures, which fails to conform with the NATA[1] and American College of Sports Medicine[3] position statements. We are unsure of the exact reasons why ATs do not have policies for hydration-related conditions. Future researchers should investigate barriers and why many clinicians do not use weight charts to identify hypohydrated or hyperhydrated athletes or have designated policies to follow.

We found that ATs used a change in body mass of –3% as the clinical threshold for intervention, which is appropriate because performance, cardiovascular, and thermoregulatory decrements were observed when this percentage was exceeded.[4,5,8,9] It is important to predetermine a threshold for developing policies and individualizing interventions, such as recommending the fluid amounts an athlete should consume to return to a euhydrated state.[1,3,7] Athletic trainers should not recommend athletes consume arbitrary amounts of fluids without knowing their change in body mass.[2,25] Examples of percentage hydration thresholds that can be used to set policies are provided in Table 5, but clinicians are encouraged to tailor the policies to their clinical setting.

When the AT deemed a fluid intervention was warranted, an overwhelming majority intervened with oral education about rehydration. Any education (oral or written) as a sole intervention produced mixed results.[26,27] In a cohort study,[28] investigators found that a 1-time education session was not enough to affect hydration behaviors compared with individual guidelines in adolescent athletes. In another study,[29] the authors demonstrated that multiple sessions of an educational intervention effectively instilled positive hydration behaviors in hypohydrated athletes. As researchers continue to determine the best methods of hydration education, we support ATs' use of oral interventions. Providing individualized fluid recommendations based on the weight chart results will be more beneficial than an arbitrary general recommendation.[25] For example, if the athlete lost 1 kg from prepractice to postpractice, the AT could orally or electronically (ie, via text message) advise the athlete to drink 1 L of fluid to replace these losses.

Most ATs shared hypohydration levels with their athletes and did not refer players with nonemergency hypohydration to sports medicine team members. Athletic trainers must remain mindful of the importance of an interdisciplinary health care team approach. Of those ATs who referred athletes to other sports medicine professionals, Division I ATs referred to dietitians more than ATs in other settings, most likely because of access and ease of referral. Athletic trainers are knowledgeable about hydration and can effectively monitor and treat athletes with hydration concerns.[30] Hydration information should at least be shared with coaches, regardless of level, as some athletes feel that coaches are barriers to drinking during practices. Coaches who are educated on hydration topics can encourage proper drinking habits to keep their players safely performing at peak levels.[31]

CONCLUSIONS

The majority of ATs surveyed in athletic settings did not use weight charts. Of those who did use weight charts, the primary focus was on football athletes for 3 weeks during the preseason and within-practice changes only. Educational workshops or technology applications could be developed to begin changing the culture to encourage more ATs to use weight charts with more teams and to calculate percentage differences from verified, hydrated baseline weights. Athletic trainers should develop policies to help prevent hypohydration and hyperhydration in athletes and support withholding athletes from participation when needed.

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