

Improving Performance of Youth Athletes Using Proactive Hydration Practices

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Applied Research Summary

Summary of the Research

Any coach of young athletes needs to be aware of and implement best practices from recent research concerning pre-hydration and maintaining hydration in the midst of competition for the sake of improving the performance of young athletes. Here are some quick points that summarize what the research says about hydration improving performance and how to achieve that proper hydration:

- 1) **DEHYDRATION HINDERS OPTIMAL PERFORMANCE.** *If your athletes aren't hydrated, they don't perform as well.*
- 2) **YOUNG ATHLETES WHO ARE BETTER HYDRATED PERFORM BETTER.** *Your athletes perform better if they are hydrated.*
- 3) **YOU NEED TO HYDRATE NO MATTER WHERE YOU ARE.** *No matter where or when or what sport your athletes are performing, you need to make hydration important.*
- 4) **DRINKING WATER BEFORE AND DURING PERFORMANCE ARE EQUALLY IMPORTANT TASKS.** *To be their best, young athletes have to drink before the performance, not just during it.*
- 5) **PROPER HYDRATION REQUIRES EDUCATION.** *Young athletes need to have the knowledge of why proper hydration is important and the practical skills to implement it in order to reap its benefits.*

Rationale for the Research

Hydration is an ever-present buzz word in the world of sports. Any avid competitive sports fan would have caught wind of news over the past couple of years concerning hydration of elite athletes. One marquee case, focusing on pre-hydration, was the story of the 2015-2016 Division 1 men's basketball champions – the Villanova Wildcats. The Wildcats' coaching staff administered a type of hydration test before practice and if the athlete was not in a state of euhydration (a normal amount of water in the body) he was not permitted to practice. Furthermore, another high profile example of hydration in the news for major sports was during the 2014 World Cup in Brazil when the United States men's national soccer team participated in the first mandatory water break in the history of competitive professional soccer while playing Portugal in the city of Manaus. During the World Cup, a Brazilian court ordered FIFA to implement mandatory water breaks after 30 minutes of play if the temperature was at or

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exceeded 32 degrees Celsius during the tournament. The organization has since adopted this procedure for any contest it oversees.

However, what about hydration in youth sports? Is it of as tantamount importance to young athletes as professional ones? Generally speaking, common coaching knowledge dictates that youth hydration is firstly important for the sake of athlete safety as increasingly prevalent research about causes of exertional heat injury indicates that proper hydration can help prevent it. Also, some recent research shows that hydration is relevant to and important for performance and my research focuses on how proper hydration betters performance and how to reach proper hydration. My applied research summary explores this second aspect specifically hydration in young athletes categorized as competitive (mostly amateur), young minors specifically “tween and teen athletes” (Casa, 2005).

This research is particularly interesting to me as both a middle school and high school boys’ soccer coach because all of my student-athletes fit the categories detailed above for youth athletes and in my subjective experience and observation, dehydration seems to be an ever-present issue but, when hydration is emphasized, my team as a whole seems to perform a little bit better. I wanted to know if this was just happenstance or if there was valid research to support my subjective summation.

Explanation of the Research

In this section, I will elaborate on the five major points that I made in the Summary of the Research Section of my paper.

The first conclusion is likely one common sense would have made clear but is worth padding with research nonetheless. **Moderate to extreme dehydration leads to performance lower than could otherwise be expected for athletes.** Recent research concurs with past research in justifying good fluid intake:

“it is well documented that even moderate levels of dehydration increase physiological strain, most likely through disproportionate elevation in heart rate and a concomitant reduction in cardiac output, resulting in the body’s inability to dissipate heat...

furthermore, water losses [exceeding] 2% of total body weight impair exercise and skill performance significantly...even lower levels of dehydration provoke unfavorable changes in the athletic performance” (Artanuotis, 2015).

Simply put, if you don’t drink enough water, you won’t perform as well.

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The second conclusion research concocts is the obverse of the one above as it is that **good levels of hydration improves young athletes' endurance athletic performance**. According to research done on ninety-two trained mixed gender 13-14 year old volleyball and basketball players over the first two days of a sports camp, “the improvement of hydration status...led to significant increases in endurance exercise performance”(Kavouras, 2012). The inserted table below that is taken from the article (Kavouras, 2012) shows that the group receiving the intervention about hydration practices after the first day performed better at a statistically

Table 2. Performance tests

Test	CON _{pre}	CON _{post}	% change	INT _{pre}	INT _{post}	% change
600 m (s)	186 ± 10	177 ± 5	-7.7 ± 2.2	189 ± 5	167 ± 4*	-12.7 ± 1.5
30 m (s)	5.6 ± 0.1	5.6 ± 0.1	0.74 ± 1.06	5.7 ± 0.5	5.6 ± 0.6	-1.07 ± 0.72
Vertical jump (cm)	26.3 ± 1.5	25.3 ± 1.8	-0.9 ± 1.05	25.0 ± 1.0	24.6 ± 1.1	-0.4 ± 1.10
Skill test	1.5 ± 1.0	1.5 ± 1.2	0.4 ± 0.9	1.5 ± 1.0	1.6 ± 1.0	0.9 ± 0.3

Values are means ± SE. *Statistically significant difference between pre and post.

significant level. The researchers hypothesized a physiological explanation for how hydration allowed this improvement which was in accord with earlier research: “taking into consideration the fact that no differences were found in the heart rate immediately after the 600 m performance test, is that stroke volume was better preserved, consequently cardiac output was maintained and as a final result, aerobic capacity was significantly improved” (Kavouras, 2012).

Another significant contribution to my research is that two myths that I have been operating under as a coach were debunked as a result of compiling it. The first myth that was corrected was that **emphasizing hydration only in particular circumstances such as when the activity is outdoors and/or in the heat is not comprehensive enough**. Research with fifty-nine young male athletes (age range 14 – 16) from different sports led to the following understanding: “the majority of the young athletes started practice in a hypohydrated state and maintained or even aggravated their pre-exercise hypohydration state, despite *ad libitum* fluid consumption throughout the day” (Artanuotis, 2015). To clarify some of the science involved here, hydration levels (in this case hypohydration – low levels of hydration) are often determined via testing for urine osmolality (a measurement of the ratio of particles to water in urine) and *ad libitum* fluid consumption is drinking water during athletic performance. Also to note, researchers in this study made this decisive discovery which reinforces the lack of validity to the myth: “remarkably, we also observed that basketball and gymnastic athletes experienced the higher degree of dehydration during their practice...this observation is noteworthy, given the fact that in indoor sports like the aforementioned, athletes have much more opportunities to drink

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because of closer proximity to fluids and greater number of breaks” (Artanoutis, 2015). Along the same lines, **simply drinking water through the course of athletic performance does not constitute or lead to proper hydration**. Researchers came to the following conclusion in their research on 107 male soccer players ages 11 – 16: “findings indicate that drinking according to thirst during practice does not prevent further dehydration in suboptimally hydrated young soccer players” (Artanoutis, 2013). The emphasis on solely *ad libitum* fluid intake was also denounced in another researcher’s work: “it would appear there was a real effect of some players in neglecting their fluid consumption before a training session...therefore, while fluid consumption has predominantly been emphasized during and after training, part of the players’ education should also stress the importance of pretraining hydration” (Williams, 2012).

Speaking of education, a big take away from the research was that coaches’ knowledge of the importance of hydration was not enough to make a difference because **young athletes are not self-aware enough to understand how, when, or why to hydrate on their own volition**. An article on the topic of cultivating good hydration habits cites this fact saying that “children frequently lack the physiological drive to drink enough water to replenish fluid loss during exercise...the lack of a drive to drink, combined with social and environmental distractions, make it difficult for young athletes to maintain proper hydration during activity” (Casa, 2005). To conclude the point on education, the researchers who discovered the correlation between hydration and better endurance performance said this: “it is obvious that continued efforts must be made by coaches...in order to educate the youths toward the benefits of optimal hydration state [and] the development of more efficient hydration strategies” (Kavouras, 2012).

Conclusion

Coaches need to hear the good news that something as simple as maintaining proper hydration leads to maximized performance out of young athletes. Practically, these findings elucidate the importance of coaches having a hydration plan laid out during consecutive days of intense, multi-session workouts and a loaded schedule of competitive games as well as constant communication with my young athletes about the reasons for constantly taking in fluids. Philosophically, these findings show that there is an inexpensive, accessible means through which one could help improve young athletes’ endurance performance and thus enhance team and individual success.

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