Crimson Publishers
Wings to the Research

Short Communication

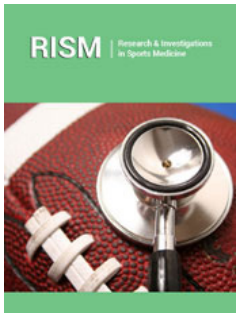
Impressions of an Electrolyte Hydration Beverage among Individuals Participating in Collegiate Soccer

SA Cage[1]*, AP Jacobsen[2], RL Peebles[2], J Gibson[2], D Lege[1], EJ Bobel[2] and RX French[2]

[1]The University of Texas at Tyler, USA

[2]The University of Texas Health Science Center at Tyler, UT Health East Texas, USA

ISSN: 2577-1914



***Corresponding author:** SA Cage, The University of Texas at Tyler, USA

Submission: SSeptember 11, 2024

Published: September 19, 2024

Volume 10 - Issue 5

How to cite this article: SA Cage*, AP Jacobsen, RL Peebles, J Gibson, D Lege, EJ Bobel and RX French. Impressions of an Electrolyte Hydration Beverage among Individuals Participating in Collegiate Soccer. Res Inves Sports Med. 10(5), RISM.000747. 2024.
DOI: 10.31031/RISM.2024.10.000747

Abstract

It is well documented that physically active individuals participating in exercise under frequently encountered environmental conditions regularly experience mild to moderate dehydration. Previous research has shown that dehydrated individuals exhibited decreased cognitive and physical performance during physical activity. As such, ensuring individuals are properly hydrated during exercise is of critical importance to sports medicine healthcare providers. Therefore, the purpose of this study was to describe the opinions of individuals participating in collegiate men's and women's soccer related to an electrolyte hydration beverage. A secondary purpose of this study was to describe the effect of the examined beverage on gastrointestinal health. A total of 61 individuals participating in collegiate soccer (age=21±2 years, Male=25, Female=36) from an NCAA Division II institution were enrolled in this study. During preseason training camp, participants were provided with enough electrolyte hydration beverage powder (Ever Lyte® sticks, Kent Precision Foods Group, Inc., Muscatine, IA) to be able to drink two of the beverages per day. Following consumption of a serving of the electrolyte hydration beverage, participants were instructed to fill out an electronic survey. The survey included questions collecting information about demographics, the participants' impressions of the beverage, and gastrointestinal symptoms following drinking the beverage. 95% (N=58) of the participants answered "Like Extremely", "Like", or "Like Somewhat" when asked about their overall impressions of the beverage. Out of the 61 participants, only five reported a mild increase in gastrointestinal symptoms. After consuming the beverage, four participants reported mild bloating, and one participant reported mild acid reflux. No participants reported moderate to severe gastrointestinal symptoms after drinking the beverage. This study demonstrated that the tested electrolyte hydration beverage was well received by the tested group of individuals participating in collegiate soccer. Sports medicine clinicians attempting to improve the hydration behaviors of their patients should consider using a similar hydration strategy. Future research should study the impact of electrolyte beverages on muscle performance during exercise, and hydration status during and after exercise. In the interim, clinicians should seek out hydration options that encourage regular fluid intake by their patients.

Introduction

It is well documented that physically active individuals participating in exercise under frequently encountered environmental conditions regularly experience mild to moderate dehydration [1-3]. This dehydration in individuals can become problematic for a number of reasons. Of note, previous research has shown that dehydrated individuals exhibited decreased cognitive and physical performance during physical activity [4-6]. In fact, a loss of as little as 2.5% of body weight can result in self-reported symptoms commonly found in patients suffering from mild traumatic brain injury [7]. As such, ensuring physically active individuals are properly hydrated during exercise is of critical importance to sports medicine healthcare providers. Various education interventions have been studied for improving hydration practices among physically active individuals [8-10]. While the studies showed an increase in acute knowledge of the importance of hydration, the authors noted that their findings did not consider all factors of hydration [8,9]. The authors of these studies posited that there

were individual barriers to hydration that needed to be analyzed in order to find the most valuable interventions for improving hydration among physically active individuals. In addition to lack of knowledge, physically active individuals have reported barriers to appropriate hydration including, lack of sources of food and hydration, lack of finances for securing food and hydration, lack of time to prepare appropriate meals, and dislike of food and beverages provided during team functions [11,12]. The final barrier affirms previous findings that taste is an important factor in the likelihood of hydration during physical activity. Physically active individuals have repeatedly been found to readily hydrate during exercise if the beverages provided to them have an appealing taste [13-15]. This places importance on flavor when considering having beverages available for physically active individuals that are. However, there appears to be a lack of research on the flavor appeal of hydration beverages among individuals participating in moderate to vigorous physical activity despite holding relatively high importance. Therefore, the purpose of this study was to describe the opinions of individuals participating in collegiate men's and women's soccer related to an electrolyte hydration beverage. A secondary purpose of this study was to describe the effect of the examined beverage on gastrointestinal health.

Methods

Participants

Participants were recruited for this study via announcements during team meetings. A total of 61 individuals participating in collegiate soccer (age=21±2 years, Male=25, Female=36) from an NCAA Division II institution were enrolled in this study. All participants were informed of the study's purpose, and informed consent was obtained per institutional review board standards.

Intervention

Table 1: Nutrition facts about electrolyte hydration beverage.

Nutrient Information	Amount, Percent of Recommended Dietary Allowance
Calories	100kcal
Total Fat	0g, 0%
Saturated Fat	0g, 0%
Trans Fat	0g
Cholesterol	0g, 0%
Sodium	135mg, 6%
Total Carbohydrate	26g, 9%
Dietary Fiber	0g, 0%
Total Sugars	25g
Added Sugars Included	25g, 50%
Protein	0g
Vitamin D	0mcg
Calcium	25mg, 2%
Iron	0mg, 0%
Potassium	110mg, 2%

During preseason training camp, participants were provided with enough electrolyte hydration beverage powder (Ever Lyte® sticks, Kent Precision Foods Group, Inc., Muscatine, IA) to be able to drink two of the beverages per day. Participants were instructed to continue with their normal hydration behaviors in addition to drinking the beverages before, during, or after practice. Participants were instructed to mix the powder in 20 oz of water and consume, before, during or after practice while otherwise continuing with their normal hydration behaviors. Nutrition facts about the beverage tested are included in Table 1.

Data collection

Following consumption of a serving of the electrolyte hydration beverage, participants were instructed to fill out an electronic survey. The survey included three fills in the blank, and two multiple choice questions intended to gather demographic information. Following the demographic section, subjects were asked one multiple choice question on the flavor of beverage they consumed, one multiple choice question on the temperature of the water they consumed the beverage with, five multiple choice questions on their impressions of the beverage answered on a six point Likert scale ranging from "Dislike Extremely" to "Like Extremely", and two multiple choice questions on their preference of the beverage over water or other electrolyte beverages answered on a six point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". The final section asked participants to report any gastrointestinal symptoms they experienced after drinking the beverage using seven multiple choice questions.

Statistical analysis

Relevant data from the survey was transferred to, and analyzed using, a commercially available statistics software package (SPSS Version 28, IBM, Armonk, NY). A total of 61 individuals participating in collegiate soccer participated in the study. Data assessed included flavor of electrolyte hydration beverage ingested, impressions of the beverage, preference of the beverage compared to water and other hydration beverages, and impact of the beverage on gastrointestinal symptoms. Frequencies, means, and standard deviations were calculated where appropriate. A one-way ANOVA was performed to assess changes in impressions on the beverage based on the temperature of the water used to mix the beverage powder. Independent samples t-tests were performed to assess differences in impressions of the beverage based on flavor ingested. Significance was set at $p<0.05$ a priori.

Result

Impressions of beverage

The flavors of the beverages tested in this study were lemon lime and orange (Lemon Lime=50, 82%, Orange=11, 18%). Impressions of the beverage are detailed in Table 2. Overall impressions are further detailed in Figure 1. There were no significant differences found in impressions of the two flavors. Temperature of the water mixed with the beverage powder did not have a significant effect on impressions of the beverage.

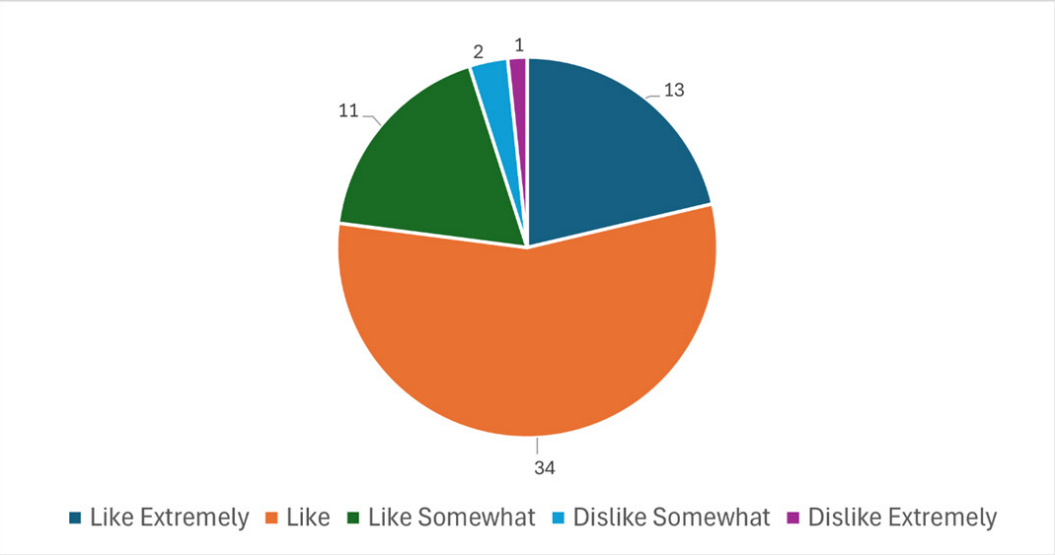


Figure 1: Overall impressions of electrolyte hydration beverage.

Table 2: Impressions of electrolyte hydration beverage.

Factor	Choices	Response
Appearance	Like Extremely	12, 19.7%
	Like	35, 57.4%
	Like Somewhat	10, 16.4%
	Dislike Somewhat	1, 1.6%
	Dislike	2, 3.3%
	Dislike Extremely	1, 1.6%
Taste	Like Extremely	16, 26.2%
	Like	32, 52.5%
	Like Somewhat	10, 16.4%
	Dislike Somewhat	2, 3.3%
	Dislike Extremely	1, 1.6%
Texture	Like Extremely	11, 18.0%
	Like	39, 63.9%
	Like Somewhat	6, 9.8%
	Dislike Somewhat	4, 6.6%
	Dislike Extremely	1, 1.6%
Smell	Like Extremely	12, 19.7%
	Like	36, 59.0%
	Like Somewhat	12, 19.7%
	Dislike Extremely	1, 1.6%
Overall	Like Extremely	13, 21.3%
	Like	34, 55.7%
	Like Somewhat	11, 18.0%
	Dislike Somewhat	2, 3.3%
	Dislike Extremely	1, 1.6%

Preferences of hydration beverage compared to other hydration options

The majority of participants stated that they would prefer to hydrate using the tested electrolyte hydration beverage compared to either water or other hydration options. Responses to these questions are detailed in Table 3.

Table 3: Preferences of tested beverage compared to other hydration options.

Response to the Prompt "I Would Prefer to Hydrate Using this Product Compared to..."	Water	Other Options
Strongly Agree	12, 19.7%	12, 19.7%
Agree	16, 26.2%	14, 23.0%
Somewhat Agree	20, 32.8%	25, 41.0%
Somewhat Disagree	6, 9.8%	7, 11.5%
Disagree	5, 8.2%	1, 1.6%
Strongly Disagree	2, 3.3%	2, 3.3%

Gastrointestinal tolerability

Out of the 61 participants, only five reported a mild increase in gastrointestinal symptoms. After consuming the beverage, four participants reported mild bloating, and one participant reported mild acid reflux. Overall, this represented an 8.2% rate of mild gastrointestinal symptoms following consumption of the beverage. No participants reported moderate to severe gastrointestinal symptoms after drinking the beverage.

Discussion

The purpose of this study was to describe the opinions of individuals participating in collegiate men's and women's soccer related to an electrolyte hydration beverage. A secondary purpose of this study was to describe the effect of the examined beverage on gastrointestinal health. Overall, the participants in this study had a favorable opinion of the electrolyte hydration beverage that was tested. Furthermore, the majority of participants expressed that they would prefer to hydrate using the tested beverage compared to other hydration options. As previously mentioned, a beverage with an unfavorable flavor can be a barrier to appropriate hydration

behaviors [11,12]. This places a need on being able to provide physically active individuals with hydration options that they enjoy drinking. Based om these results, individuals participating in collegiate men's & women's soccer enjoyed the taste, smell, appearance, and texture of the tested electrolyte hydration beverage. This would suggest that the tested beverage would aid in encouraging proper hydration behaviors among individuals participating in collegiate soccer. A possible limitation of this study was that the sample size for this study was relatively small. Given that this study was done at a single institution, there were limitations with recruiting a larger sample size. Compared to other studies on hydration practices in physically active individuals, the sample size for this study was similar [16-18]. Future studies should examine a larger sample from multiple institutions to allow for more generalizable conclusions.

Conclusion

To the authors' knowledge, this is the first peer reviewed study describing the impressions of individuals participating in moderate to vigorous physical activity regarding an electrolyte hydration beverage. This study demonstrated that the tested electrolyte hydration beverage was well received by the tested group of individuals participating in collegiate soccer. Sports medicine clinicians attempting to improve the hydration behaviors of their patients should consider using a similar hydration strategy. Future research should study the impact of electrolyte hydration beverages on muscle performance during exercise, and hydration status during and after exercise. In the interim, clinicians should seek out hydration options that encourage regular fluid intake by their patients.

References

1. River Brown AM, Quinones Gonzalez JR, Pagan Lasalle P (2018) Fluid intake pattern, dehydration and performance in young athletes during a triathlon in tropical climate. Medicine and Science in Sports & Exercise 50(5S): 342.
2. Goulet EDB (2012) Dehydration and endurance performance in competitive athletes. Nutrition Reviews 70(11): S132-S136.
3. Sebastia Rico J, Soriano JM, Sanchis Chorda J (2014) Analysis of fluid balance and urine values in elite soccer players: Impact of different environments, playing positions, sexes and competitive levels. Nutrients 16: 903.
4. Zheng AC, He CS, Lu CC, Hung BL, Chou KM, et al. (2024) The cognitive function and Taekwondo-specific kick performance of Taekwondo athletes at different hydration statuses. International Journal of Sports Physiology and Performance 19(7): 637-644.
5. Geng Z, Wang J, Cao G, Tan C, Li L, et al. (2024) Differential impact of heat and hypoxia on dynamic oxygen uptake and deoxyhemoglobin parameters during incremental exhaustive exercise. Frontiers in Physiology 14: 12747659.
6. Martinez Aranda LM, Sanz Matesanz M, Orozco Duran G, Gonzalez Fernandez FT, Rodriguez Garcia L, et al. (2023) Effects of different rapid weight loss strategies and percentages on performance-related parameters in combat sports: An updated systematic review. International Journal of Environmental Research and Public Health 20(6): 5158.
7. Patel AV, Mihalik JP, Notebaert AJ, Guskiewicz KM, Prentice WE (2007) Neuropsychological performance, postural stability and symptoms after dehydration. Journal of Athletic Training 42(1): 66-75.
8. Kobayashi K, Yasuda N (2022) Effectiveness of hydration education to improve hydration status during summer seasons in adolescent female indoor-sport athletes. Journal of Science and Medicine in Sport 25(2): S8.
9. Abbasi IS, Lopez RM, Kuo YT, Shapiro BS (2021) Efficacy of an educational intervention for improving the hydration status of female collegiate indoor-sport athletes. Journal of Athletic Training 56(8): 829-835.
10. Dubose J, Shows AR, Ruiz CS, Chilek D (2013) Effect of hydration education on knowledge and practices of high school male athletes in southeast Texas. Journal of the Academy of Nutrition and Dietetics 113(9): A87.
11. Parks RB, Sanfilippo JL, Domeyer TJ, Hetzel SJ, Brooks MA (2018) Eating behaviors and nutrition challenges of collegiate athletes: The role of the athletic trainer in a performance nutrition program. Athletic Training and Sports Health Care 10(3): 117-124.
12. Jayawardena R, Weerasinghe K, Madhujith T, Hills AP, Kalupahana N (2024) Perceptions of the importance of sports nutrition knowledge and barriers in implementing them: A qualitative study among track and field stakeholders in Sri Lanka. BMC Nutrition 10(1): 17.
13. Block JP, Gillman MW, Linakis SK, Goldman RE (2013) If it tastes good, I'm drinking it: Qualitative study of beverage consumption among college students. Journal of Adolescent Health 52(6): 702-706.
14. Kostecka J, Jackowska I, Chabros I, Kostecka Jarecka J, Kawecka P, et al. (2024) Beverage consumption and factors influencing the choice of beverages among polish children aged 11-13 years in 2018-2023. Nutrients 16(11): 1625.
15. Wong SH, Sun FH (2014) Effect of beverage flavor on body hydration in Hong Kong Chinese children exercising in a hot environment. Pediatric Exercise Science 26(2): 177-186.
16. Arnaoutis G, Kavouras SA, Angelopoulou A (2015) Fluid balance during training in elite young athletes of different sports. Journal of Strength & Conditioning Research 29(12): 3447-3452.
17. Racinais S, Ihsan M, Taylor L (2021) Hydration and cooling in elite athletes: Relationship with performance, body mass loss and body temperatures during the Doha 2019 IAAF World Athletics Championships. British Journal of Sports Medicine 55(23): 1335-1341.
18. Palka T, Rydzik L, Koteja PJ (2024) Effect of various hydration strategies on work intensity and selected physiological indices in young male athletes during prolonged physical exercise at high ambient temperatures. Journal of Clinical Medicine 13(4): 982.