

# Hydration and Physical Activity: Perception of Volta Zone College of Education Athletes in Ghana

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**Abstract** While substantial literature exists on the knowledge, attitude and behaviour among athletes on hydration, little is known about these variables in the Ghanaian context. In view of this dearth in literature, this study investigated the knowledge, attitude and behaviour among College of Education (CoE) athletes on hydration within the context of the KAP Model Theory in the Volta Region of Ghana. The study utilized the cross-sectional descriptive survey design with quantitative approach where 103 CoE athletes were sampled using random sampling technique. After checking for validity and reliability, a structured questionnaire was used to collect data for the study which was analyzed using descriptive statistics such as frequency counts, percentages, mean, standard deviation and inferential (Pearson Moment Correlation, Independent samples t-test and One way between ANOVA) statistics. The findings of the study revealed that even though Volta Zone College of Education athletes had fair knowledge and attitude towards hydration, they exhibited good behaviour towards hydration. Besides, the findings further revealed that athletes' knowledge, attitude and behaviour towards hydration was not statistically significant as knowledge had weak association on attitude whereas attitude had a much weaker association with behaviour. Additionally, athletes' demographic variables such as age and gender did not significantly influence their knowledge, attitudes and behaviours towards hydration. Hence, the study identifies the need to recommend for new learning strategies for teacher trainees and athletes to improve their knowledge, attitudes, and practices with regards to hydration.

**Keywords:** attitude, behavior, euhydration, hydration, knowledge, demographic variables, physical activity

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## 1. Introduction

The tremendous impact of euhydration, thus, practice of maintaining body water within its optimal homeostatic range in all spheres of human endeavours including physical activity and sports underscores the importance of hydration being not only critical in ensuring effective functioning and performance but the safety of athletes during and after sporting activities. [1] lent credence to this assertion when they argued that living cells require hydration for sustenance of metabolic activities, elimination of metabolic waste, electrolyte homeostasis, acid-base balance, temperature regulation and effective functioning of various systems (respiratory, digestive, renal, cardiovascular, neural, sensory endocrine and haematopoietic systems). Practitioners like [2] averred that ensuring proper hydration strategies and practices are instrumental and an important component in enhancing mental and sport performance. [3] corroborated this view when they noted that it is essential for athletes to replenish

fluid losses, not only during games and practices, but consistently throughout the day because it regulates body temperature, keeps tissues moist, lubricates joints, and hydrates muscles. It is deduced from these claims that practicing effective euhydration is vital for success in physical activity and sports performance.

Accordingly, recent hydration studies have recounted the effects of dehydration and the need for athletes to ensure proper hydration practices. In this direction, [4] stressed that generally, indications of being dehydrated are varied and may hinge on the degree of fluid deficit. However, the symptoms range from mild to moderate headache, tiredness, dizziness, confusion, reduced motor activities, reduced cognitive functioning and difficulty in concentrating. Supporting this view, researchers like [5] posited that dehydration besides decreasing cognitive, visual, psychomotor and physical performance of athletes, is also on record to be associated with dysfunctioning of the dopaminergic and noradrenergic systems, impaired cholinergic activities leading to defective neurotransmission. As observed by [6] a shortfall of 1-2% of the body fluid leads to mild dehydration, while losses of more than 5%

of the total body fluid leads to severe dehydration. These findings suggest that athletes might not perform optimally when they practice improper hydration. Deductively, these researchers consider the practice of proper hydration as a sifter to desirable physical activity and sports performance, and that athletes need to be well-grounded in optimal hydration practices for enhanced sports performance. The conclusion drawn from these studies is that proper hydration is a basis for a successful physical activity and sports performance.

Based on the affirmation that proper hydration is crucial to desired sports performance among athletes, sports nutrition researchers have inquired into the knowledge, attitudes and behaviours of athletes towards hydration with the conviction that having good knowledge will be helpful and translate into exhibiting attitudes and desirable behaviours towards hydration. In this regard, [7] upheld that uncovering the reasons behind certain hydration practices and behaviours among athletes are not only vital but it is also critical in order to alter behaviour and practices inimical to the growth and success of athletes. These practices and behaviours resonate well with this study which sought to unpack the level of knowledge, attitudes, and behaviours of athletes about hydration in context of College of Education athletes. Researchers are convinced that physical activities engaged in by athletes can cause an acute interference to their fluid balance, hence, a challenge to the athlete's goal of optimal performance and safety during exercise, especially in hot environmental conditions [8] and [9].

Additionally, recent studies have acknowledged that it is not uncommon for individuals and athletes to involuntarily dehydrate where there could be less consumption of fluid than their fluid needs or overhydrate by taking in excess fluid which in itself can also be problematic, with hyponatremia developing in severe cases of overhydration. Therefore, inappropriate management of fluid intake resulting in hypohydration, or hyperhydration, can be detrimental to performance and in some circumstances, increases health risk [10]. In essence, it would be expected that athletes pay attention to the practice and maintenance of optimal hydration and see it as a viable medium for physical activity and improved sports performance, and ultimately, protect them from being susceptible to health risk or diseases.

Despite the call for athletes to endure and practice optimal hydration, empirical evidence have revealed that there is spike and surge of inappropriate hydration practices among athletes especially in basic schools, senior high schools, colleges and universities around the world [11,12,13]. [7] observed that many college athletes are oblivious of what role proper hydration will play in their sports performance, future careers and lives. This lack of awareness leads to negative attitudes and practices among college athletes and many other athletes towards proper hydration. It was further documented that athletes commonly perform and train by consuming insufficient fluid and electrolytes just prior to, or during training and competition and that unlike non-athletes or athletes who do not engage in frequent rigorous and prolonged training sessions, "hard trainers" may require additional sodium and better benefit from a hydration plan tailored to their individual physiology [14]. Besides, it has been noticed

that to maintain and sustain an optimal state of hydration during physical activity becomes more complicated depending on the sport, type of activity and availability of fluid [15]. These scholars further observed that optimal hydration is dependent on many factors but can generally be defined during physical activity as avoiding losses greater than 2-3% of body mass while also avoiding overhydration. It is in line with this issue that the current standard-based Physical Education Curriculum included hydration to educate learners at formative ages to develop a positive attitude to water intake during physical activity to prevent risk behaviours of euhydration [16].

Currently, there is a general consensus that good hydration practices must and should include: firstly, beginning exercise in a state of euhydration, also, preventing excessive hypohydration during exercise, and finally, replacing remaining losses following exercise prior to the next exercise bout [17,18,19]. These scholars further accentuated that respecting these hydration practices attenuate the adverse effects of acute dehydration on physical activity and health. Nevertheless, it has been recognized that fluid needs are individualistic and is peculiar in nature and is contingent on factors such as personal sweat rate, exercise mode, exercise intensity, environmental conditions and exercise duration. Additionally, characteristics and rules unique to each sport environment in which it is played, event uniform and equipment, and the availability of fluid during both training and competition may greatly influence the ability to optimize hydration during activity [17,18]. Though consciousness and sensation of thirst, a centrally mediated response to body water deficits, is useful in dictating the need for fluid intake during daily life, thirst is relatively insensitive in acutely tracking hydration status during exercise [8,9]. It is inferred from these findings that ensuring proper hydration is contingent on a plethora of factors, however, juxtaposing the various factors underlying improper hydration, it could be realized that the first point to note is the appreciation of the improper hydration practices have deleterious effects on performance. Next to appreciation is the challenge of not having adequate knowledge to the successful endurance of proper hydration practices. It could be concluded that consciousness of the role that fluid plays in athletic performance and knowledge of how to maintain hydration during practices and competition is necessary to maximize desired hydration practices.

Consequently, research on the relationship between knowledge on athletes' practices thus, attitude and behaviours towards hydration has received considerable attention in the past decades, and therefore, not new. Before ascertaining this nexus, studies have explored the level of knowledge, attitudes and behaviours of athletes on hydration around the world. Indeed, studies by scholars such as [20] in England on the hydration status and fluid balance of elite European youth soccer players during consecutive training sessions revealed that athletes had inadequate knowledge on hydration resulting in pushed athletes being in a dehydrated state throughout practice and post-exercise. In their study, [21] disclosed that out of the 185 collegiate athletes who were assessed on their knowledge of hydration and intake of micro and macronutrients, exhibited adequate knowledge in these

areas. [22] established an average knowledge on hydration practices among athletes. In Nigeria, studies by [1] and [23] have all disclosed that nearly half 44% and 46.4% either drank less than 2.7 L of water per day or dehydrated respectively indicating high incidences of dehydration as a result of poor knowledge on proper hydration practices. Therefore, the literature on athletes' level of knowledge on hydration has demonstrated inconsistent results which call for further studies into the matter.

On attitudes and behaviour of athletes towards hydration practices, [24] study on the knowledge, attitudes and practices on hydration and fluid replacement among endurance sports athletes in National University of Malaysia revealed that even though athletes had adequate knowledge on hydration and fluid replacement, they did not practice the knowledge they reported as seen in their attitudes and behaviour towards hydration and fluid replacement. Similarly, [25,26,27] findings in Greece and Portugal respectively revealed that despite having adequate knowledge on hydration practices athletes were still found to be in both hypo and hyper hydration states, implying that having knowledge on proper hydration practices does not really translate into desirable attitudes and behaviour towards proper hydration practices. The study noted that knowledge, attitude and practice are closely inter-related as a good level of knowledge would translate into having a deep impact on attitudes and practices of athletes' hydration. However, [28] revealed a strong positive and significant relationship between attitude and behaviour. These findings have proven that knowledge, attitudes and behaviours towards hydration could differ from settings which offer opportunities for further studies to be conducted in specific contexts. Nonetheless, there is no evidence of poor attitude and behaviour among athletes towards hydration in Ghana which calls for studies into the matter.

Besides, athletes knowledge, attitudes and behaviours towards hydration, researchers have investigated the effect of athlete's demographic variables (sex, age, level and teams) on their hydration practices. In their study, [29] discovered that gender significantly correlated with hydration knowledge, with males having significantly higher hydration knowledge than females. Again, athletes' knowledge on hydration significantly correlated their attitude and behaviour towards hydration. However, knowledge, attitudes and behaviour on hydration was significantly different between athletes from different types of sports, age groups, and education levels. On whether age is a factor that determines athletes' knowledge, attitude and practices of hydration, [30] revealed that athletes below 20 years reported higher knowledge and practices of hydration than older athletes. Contrarily, [13] disclosed that even though there were no significant differences among demographic variables for athletes on their attitudes towards hydration, there were significant differences noted between some of the demographic variables for athletes behaviour towards hydration where both men's soccer team and the women's soccer team scored significantly higher on the behaviour section than did the men's cross country team and the women's cross country team. In addition, the football team also scored significantly higher than did the women's cross country team.

Scrutiny of the above studies suggested that there is some amount of controversy; that while some researchers argue that demographic variables of athletes is a factor that determine athletes' knowledge, attitudes and practices towards hydration, others insist that demographic variables of athletes have no influence on their knowledge, attitudes and practices towards hydration. Based on these conflicting results among scholars, this study explored the extent to which athletes' demographic variables affect their perception of hydration. The issue is "Does demographic gap exists in athletes' knowledge, attitudes and behaviours towards hydration in Ghana?" Besides, there is dearth of studies on athletes' knowledge, attitudes, and behaviours towards hydration among students and athletes in Ghana, especially in the Colleges of Education. Hence, understanding the knowledge, attitudes, and behaviours of athletes regarding hydration is one of the surest ways to mitigate the negative impact of dehydration. This study was therefore, conducted to provide answers to the following research question and hypotheses:

1. What is the level of knowledge, attitude and behaviour of Volta Zone Colleges of Education (CoE) athletes on hydration?

### 1.1. Hypotheses

1. There will be no statistically significant relationship between Volta Zone CoE athletes' level of knowledge, attitude and behaviour towards hydration in physical activity and sports.
2. There is no statistically significant difference between Volta Zone CoE athletes' age and knowledge, attitudes and behaviour towards hydration in physical activity and sports.
3. There is no statistically significant difference between athletes' gender (male/female) and knowledge, attitudes and behaviour towards hydration in physical activity and sports.

## 2. Theoretical Framework: Knowledge, Attitude and Practice Theory

This study attempted to understand the relationships among knowledge of, attitude toward, and preventive behavior against occurring phenomenon (hydration), using a randomly selected sample and no research intervention. KAP is an abbreviation; where "K" stands for knowledge of the problem "A" for attitude towards the problem, and "P" for practice or preventive behavior to protect against the problem. Researchers assume that knowledge, attitude, and practice are related, and that knowledge and attitude directly influence preventive practice. Surveys are used to measure what individuals know about the health problem. Attitude instruments measure the feelings and beliefs of survey participants about the problem, and information on practice measures and the preventive behaviours that individuals follow to avoid a problem.

Knowledge is the acquisition, retention, and use of information or skills [31]. Cognition through which knowledge is acquired is a process of understanding and is distinguished from the experience of feeling. Knowledge accrues from both education and experience. [32,33]

defined attitude as a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour. Practice demonstrates the acquisition of knowledge (increased understanding of a problem/disease) and any change in attitude caused by the removal of misconceptions about problems that translates into preventive behaviours. Thus that demonstration may reflect a reciprocal relationship between knowledge and attitude. Practice is behaviours or actions that can avert a disease or delay its progression.

This study also rooted within the parameters of the Health Belief Mode (HBM) [34]. One of the oldest theories seeking to explain human health behaviour. An individual will perform a preventive behaviour if the individual believes that he/she is vulnerable to a problem (susceptibility) that the after-effects of the problem are serious HBM, attempts to predict human behaviour by considering differences in individual beliefs and attitudes and practice. The HBM model, thus, identifies as an initial predisposing factor the desire to avoid complications of hydration; but the model does not mediate factors responsible for enabling and maintaining preventive behaviour over time.

### 3. Methodology

The cross-sectional descriptive survey design in line with the positivist epistemology was utilized for the study. The cross-sectional descriptive survey design seeks to describe and interpret what exists in its present condition, attitudes, practices and beliefs [35] at one point in time which is in line with the purpose of the study which sought to elicit information from respondents on their knowledge, attitude and behaviour towards hydration. The target population for the study was all athletes from the forty-six (46) public Colleges of Education (CoE) present at the 11<sup>th</sup> College of Education Sports Association (COESA) Games. The colleges were categorized into five (5) Zones, namely, Eastern and Greater Accra (EGA) Zone, Volta Zone (VOLTA), Northern Zone (NORTHERN), Central and Western Zone (CENTWEST) and Ashanti and Brong-Ahafo Zone (ASHBA). The accessible population included athletes from VOLTA zones. However, the sample population included the one hundred and three (103); Sixty-one (61) males and forty-two (42) female athletes who were selected from VOLTA zone through purposive sampling.

An adopted questionnaire which was pre-tested to ascertain its reliability and validity was the main instrument used for the study. It was a five point Likert Scale which include Strongly Disagree (SD), Disagree (D), Undecided (U), Agree (A) and Strongly Agree (SA). After meeting the ethical considerations underlying research, the researchers self-administered the instrument to the participants. With the aid of the version 22 of the Statistical Product for Service Solution (SPSS) descriptive statistics such as frequency, percentages, mean and standard deviation were generated whereas the study's hypotheses were analyzed using Pearson Product Moment Correlation, independent samples t-test and one-way between groups analysis of variance (ANOVA).

## 4. Presentation and Analysis of Results

Table 1. Demographic Variables of Respondents

Variables	Sub-Scales	Frequency (f)	Percentage (%)
Sex	Male	61	59.2
	Female	42	40.8
Age	Below 18	8	7.8
	18-23	46	44.7
	24-27	40	38.8
	28-33	8	7.8
	34 Above	1	1.0
Level	100	40	38.8
	200	38	36.9
	300	25	24.3
Teams	Soccer	30	29.1
	Basketball	5	4.9
	Volleyball	14	13.6
	Track	23	22.3
	Netball	8	7.8
	Handball	12	11.7
	More than 1 event	11	10.7

In Table 1, out of the 103 participants, 61 (59.2%) were males whereas 42 (40.8%) were females. The results of the Volta Zone CoE athletes' background characteristics show that most of their ages fall between 18 to 34. However, majority ( $n = 46$ , 44.7%) of the participants were between the ages of 18-23years, followed by 40 (38.8%) representing the age range of 24-27. Age ranges below 18 and between 28-33 recorded a frequency of 8 and percentage values of 7.8 respectively. Only ( $n=1$ , 1%) was above age 34. With regards to the level ( $n = 40$ , 38.8%) were in first year, ( $n = 38$ , 36.9%) were in their second year while ( $n = 25$ , 24.3%) were in their final year. Furthermore, the order of respondents' favourite teams were as follows; soccer, ( $n = 30$ , 29.1%), Basketball ( $n = 5$ , 4.9%), Volleyball ( $n = 14$ , 13.6%), Track ( $n = 23$ , 22.3%), Netball ( $n = 8$ , 7.8%), Handball ( $n = 12$ , 11.7%) as well as athletes who played in more than 1 team ( $n = 11$ , 10.7%). The demographic variables of the participants were crucial to the study in two folds. Firstly, they indicated that data were collected from participants of diverse backgrounds and settings, hence improves on the richness of the data. Secondly, the demographics were useful in the comparison of the participants on the study variables to determine trends and significant differences.

### Research Question One - What is the level of knowledge, attitude and behaviour of Volta zone Colleges of Education athletes on hydration?

Research question one sought to investigate the level of knowledge, attitude and behaviour of Volta zone Colleges of Education athletes on physical activity and hydration. In this study, mean and standard deviation were calculated to determine the perceived level of knowledge, attitude and behaviour such that  $\text{mean} < 2.50$  indicated poor knowledge/attitude and behaviour,  $2.50 \leq \text{mean} < 3.50$  showed fair knowledge/attitude and behaviour, and  $\text{mean} \geq 3.50$  indicated good knowledge/attitude and behaviour and the results are shown in Table 2.

As indicated in Table 2, it could be seen that under knowledge, the athletes exhibited good knowledge on the

reliance on thirst as an indicator of dehydration ( $M=3.54$ ,  $SD=1.49$ ). Again, the athletes demonstrated good knowledge ( $M=4.13$ ,  $SD=1.13$ ) on the fact that dehydration decreases their performance. However, athletes demonstrated fair knowledge ( $M=3.27$ ,  $SD=1.34$ ) to the effect that nausea, headache, or muscle cramp to be indication of dehydration with the knowledge use of salt tablets during training and competition ( $M=2.73$ ,  $SD=1.20$ ) also being fair. On the attitude of the athletes towards hydration, it could be realized from the [Table 2](#) that the athletes exhibited good attitude to the call for water or fluid to be available to them during practice and competitions ( $M=4.16$ ,  $SD=1.32$ ). The findings also indicated that athletes exhibited good attitudes ( $M=3.60$ ,  $SD=1.29$ ) towards taking sport drink 2 hours after exercise. The athletes again, believed that it is a poor attitude ( $M=1.76$ ,  $SD=1.13$ ) not to take in water or fluid during physical activity. The athletes also agreed that it is a poor attitude ( $M=1.57$ ,  $SD=0.91$ ) for coach not to let/allow players drink any fluid during training and competition.

Under behaviour, the findings as shown in [Table 2](#) have disclosed that athletes' behaviour towards hydration was rated highest to be good on they being able to judge if they are dehydrated by monitoring the colour of their urine ( $M=4.07$ ,  $SD=1.16$ ), weighing themselves before and after practice ( $M=4.03$ ,  $SD=1.01$ ) and drinking 3.7 litres and 2.7 liters of water a day for men and women respectively ( $M=3.85$ ,  $SD=1.05$ ). Besides, athletes behaviour towards sports drinks being better than water ( $M=3.06$ ,  $SD=1.51$ ), drinking 17-20 fluid ounces of water or sports drink 10-20 minutes before competition ( $M=3.49$ ,  $SD=1.22$ ) and behaviour towards drinking of water in the morning helps to stay healthy ( $M=3.31$ ,  $SD=1.28$ ) were all judged to be fair. Generally, it could be concluded from the findings

that athletes' in Colleges of Education in the Volta Zone of Ghana had fair knowledge, fair attitude and good behaviour towards hydration. The findings of this study disagree with [\[1,20\]](#) and [\[23\]](#) study where athletes had inadequate and poor knowledge respectively on hydration. However, the finding of the study resonates with [\[21\]](#) where athletes' exhibited fair to adequate knowledge towards hydration. Again, the finding of the study where athletes demonstrated good behaviour towards hydration is in agreement with [\[25\]](#) observation of fair to adequate knowledge translating to good behaviour towards hydration but is however, in disagreement with [\[24\]](#) where good knowledge did not translate into good behaviour towards hydration.

## Test of Study's Hypotheses

### Hypothesis 1

$H_{01}$ : There is no statistically significant relationship between athletes' knowledge, attitudes and behaviour towards hydration.

This hypothesis sought to find out whether athletes' knowledge on hydration relates with their attitudes and behaviour towards hydration. The Pearson Moment Correlation was used to test this hypothesis and the interpretation of the strength of the relationship was guided by [\[36\]](#) suggestion which indicated that if the correlation coefficient is greater than 0.3 but less than 0.5, then the relationship is moderate; the relationship is weak if the correlation coefficient is less than 0.3; and the relationship is strong if the correlation coefficient is 0.5 or greater the result of the relationship between the variables are presented in [Table 3](#).

**Table 2. Descriptive Statistics on Perceived Levels of Knowledge/Attitudes/ Behaviour**

Variables	Statements	Min.	Max.	Mean	Std. Dev.
<b>Knowledge</b>	I can rely on thirst as an indicator of dehydration	1	5	3.54	1.49
	Dehydration decreases my performance	1	5	4.13	1.13
	If I experienced nausea, headache, or muscle cramp I may be dehydrated	1	5	3.27	1.34
	Using salt tablets during training and competition keeps me from dehydration	1	5	2.73	1.20
<i>SSM (SSSD)</i>	<i>Sub-scale Mean, SSSD = Sub-scale Std. Deviation</i>			3.42	1.29
<b>Attitude</b>	No water or fluids should be consumed during training	1	5	1.76	1.13
	My coach should not let our players drink any fluid during competition	1	5	1.57	0.91
	Water or fluids should readily be available to me during training and competition	1	5	4.16	1.32
<i>SSM (SSSD)</i>	<i>Sub-scale Mean, SSSD = Sub-scale Std. Deviation</i>			3.60	1.29
<b>Behaviour</b>	I believe 2 hours after training, I should drink sports drink	1	5	3.60	1.29
	<i>SSM (SSSD)</i>	<i>Sub-scale Mean, SSSD = Sub-scale Std. Deviation</i>		2.78	1.17
	Sports drinks are better than water because they restore glycogen in the muscle	1	5	3.06	1.51
	I can judge if I am dehydrated by monitoring the colour of my urine.	1	5	4.07	1.16
	Weighing myself before and after practice is a good away to determine how much fluid I have lost	1	5	4.03	1.01
	I should drink 17-20 fluid ounces of water or sports drink 10-20 minutes before competition	1	5	3.49	1.22
	Drinking of water in the morning helps to stay healthy	1	5	3.31	1.28
<i>SSM (SSSD)</i>	<i>Sub-scale Mean, SSSD = Sub-scale Std. Deviation</i>			3.85	1.05
<i>SSM (SSSD)</i>	<i>Sub-scale Mean, SSSD = Sub-scale Std. Deviation</i>			3.64	1.21

Table 3. Correlation Matrix for the Variables

		Knowledge	Attitude	Behaviour
Correlation	Knowledge	1.000	0.113	0.367
	Attitude	0.113	1.000	0.254
	Behaviour	0.367**	0.254	1.000

The results of the inter-correlation among the variables in Table 3 have revealed that the correlation between knowledge and attitude ( $r=0.113$ ) is weak, knowledge and behaviour ( $r=0.367$ ) is moderate and statistically significant, and attitude and behaviour ( $r=0.254$ ) is weak. Hence, the study has disclosed athletes knowledge, attitude and behaviour towards hydration was not statistically significant as knowledge had weak association on attitude whereas attitude had a much weaker association with behaviour. Therefore, this study accepts the null hypothesis that there is no statistically significant relationship between knowledge, attitude and behaviour of athletes' towards hydration. This finding is not in agreement with [28] who established a strong and statistically significant relationship between knowledge, attitude and behaviour towards hydration. The finding however, concurs with [27] study where no statistically significant relationship was realized between knowledge, attitude and behaviour of athletes towards hydration.

### Hypothesis 2

**H<sub>02</sub>: There is no statistically significant difference between athletes' age and knowledge, attitudes and behaviour towards hydration.**

This hypothesis sought to find out whether athletes' age would significantly predict their knowledge, attitudes and behaviour on hydration. One-way ANOVA was employed to test this hypothesis and the results as shown in Table 4.

The ANOVA results in Table 4 revealed that there were no statistically significant differences in the means for knowledge [ $F(4, 98) = 0.292, p=0.883$ ], attitude [ $F(4, 98) = 0.809, p=0.522$ ], as well as the behaviour [ $F(4, 98) = 1.442, p=0.226$ ] towards hydration at 0.05 alpha level due to age. Based on these results, it is established that athletes' age does not influence their knowledge, attitude and behaviour towards hydration. Therefore, the null hypothesis

that there is no statistically significant difference between athletes' age and knowledge, attitudes and behaviour towards physical activity and hydration is supported whilst the alternate hypothesis is not supported. This finding disagrees with [30] findings where statistically significant differences were realized for athletes' age and their knowledge, attitude and behaviour towards hydration but concurs with [13] findings which recorded significant influence of athletes' age on their knowledge, attitudes and behaviour towards hydration.

### Hypothesis 3

**H<sub>03</sub>: There is no statistically significant difference between athletes' gender (male/female) and knowledge, attitudes and behaviour towards hydration.**

This hypothesis sought to find out whether gender of the athletes would significantly predict their knowledge, attitudes and behaviour on hydration. An independent samples t-test was employed to test this hypothesis and the results as shown in Table 5.

The t-test results in Table 5 has shown that even though, females had better knowledge, attitude and behaviour than their males counterparts, there were no statistically significant differences in the means of males and females for knowledge [ $t(101) = -0.526, p=0.600, 2$ -tailed], attitude [ $t(101) = -0.480, p=0.632, 2$ -tailed], as well as the means for males and females for behaviour on physical activity and hydration [ $t(101) = -1.316, p=0.191, 2$ -tailed] at 0.05 alpha level based on gender of the athletes. Thus, the null hypothesis that there is no statistically significant difference between athletes' gender (male/female) and knowledge, attitudes and behaviour towards hydration is supported whilst the alternate hypothesis is not supported. This finding is in disagreement with [29] where male athletes had significantly better knowledge, attitude and behaviour towards hydration.

Table 4. ANOVA Results for Age and Knowledge, Attitudes and Behaviour

Variables	Age		Sum of Squares	Df	Mean Square	F	Sig.
Knowledge	Below 18	Between Groups	0.669	4	0.167	0.292	0.883
	18-23	Within Groups	56.130	98	0.573		
	24-27						
	28-33						
	34 +						
Attitude	Below 18	Between Groups	1.416	4	0.354	0.809	0.522
	18-23	Within Groups	42.848	98	0.437		
	24-27						
	28-33						
	34 +						
Behaviour	Below 18	Between Groups	2.918	4	0.730	1.442	0.226
	18-23	Within Groups	49.585	98	0.506		
	24-27						
	28-33						
	34 +						

Table 5. T-test results for Gender and Athletes Knowledge, Attitude and Behaviour

Variables	Sex	Mean	Std. Deviation	t	Df	Sig. (2-tailed)
Knowledge	Male	3.39	0.73	-0.526	101	0.600
	Female	3.46	0.78			
Attitude	Male	2.75	0.63	-0.480	101	0.632
	Female	2.81	0.70			
Behaviour	Male	3.55	0.78	-1.316	101	0.191
	Female	3.74	0.60			

## 5. Conclusions and Recommendations

The study has highlighted the need for ensuring proper hydration and, therefore, reiterates the point that proper hydration is crucial to optimal physical activity, exercise, training or sports performance among athletes in every discipline at all levels. Indeed, the athletes explicitly showed that apposite knowledge on hydration is relevant in exhibiting good attitudes and behaviours. The perceptions among the athletes that knowledge is needed for optimal attitude and behaviour imply that the athletes' would commit themselves to instructions and programmes that are intended to promote their knowledge, attitudes and behaviour towards hydration. Therefore, this study identifies the need for new learning strategies for students and athletes to improve their knowledge, attitudes, and practices with regards to hydration. In this direction, male athletes must be targeted most since they are the ones whose knowledge, attitude and behaviours towards hydration should be improved. The present study examined relatively a small sample of college of education athletes in Ghana and it would be interesting if a larger sample is used to gain a complete understanding of the issue.

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## References

- Ekpenyong, C. E. & Akpan, I. A. M. (2017). High prevalence and associated risk factors of dehydration among college students: implications for health and academic performance. *International Journal of Community Medicine and Public Health* 4(4), 1043-1055.
- Thomas, D.T., Erdman, K.A. and Burke, L.M. (2016). American college of sports medicine joint position statement: nutrition and athletic performance. *Medicine and Science in Sports and Exercise*, 48 (3) 543-568.
- Meyer F, Volterman, K.A; Timmons, B.W. and Wilk, B (2012). Fluid balance and dehydration in the young athlete: Assessment considerations and effects on health and performance. *American Journal of Lifestyle Medicine*, 6(6): 489-501
- Krečar, I.M; Kolega, M & Kunac, S.F (2014).The Effects of Drinking Water on Attention. *Procedia - Social and Behavioral Sciences*, 159(577-583)
- Popkin, B; D'Anci, K; & Rosenberg, I (2010). Water, Hydration and Health. *Nutrition Reviews*; 68 (8):439-58.
- Kenney E.L, Long, M.W, Cradock A.L, & Gortmaker S.L. (2015). Prevalence of Inadequate Hydration Among US Children and Disparities by Gender and Race/Ethnicity: National Health and Nutrition Examination Survey, 2009-2012. *American Journal of Public Health*; 105 (8). 113-118.
- Berning, K. (2018).The efficacy of a hydration education intervention program on current hydration practices. A thesis submitted to the Graduate Council of Texas State University. [https://digital.library.txstate.edu/bitstream/handle/10877/7426/BE\\_RNING-THESIS-2018.pdf?sequence=1&isAllowed=y](https://digital.library.txstate.edu/bitstream/handle/10877/7426/BE_RNING-THESIS-2018.pdf?sequence=1&isAllowed=y)
- Adams, J. D., Sekiguchi, Y.; Suh, H.G; Seal, A. D, Sprong, C. A; Kirkland, T. W, & Kavouras S. A. (2018). Dehydration Impairs Cycling Performance, Independently of Thirst: A Blinded Study. *Medicine and Science in Sports & Exercise* 50(8) 1697-1703.
- Kenefick, R.W (2018). Fluid intake strategies for optimal hydration and performance: planned drinking vs. drinking to thirst. *Sports Science Exchange (2018) Vol. 29*, No. 182, 1-6.
- McDermott, B.P; Anderson, S.A; Armstrong, L.E; Casa, D. J; Chevront, S.N; Cooper, L; Kenney, W. L.; Connor, F.G & Roberts,W.O (2017). National Athletic Trainers' Association Position Statement: Fluid Replacement for the Physically Active. *Journal of Athletic Training*, 52(9):877-895.
- Thomas, D.T., Erdman, K.A. and Burke, L.M. (2016). American college of sports medicine joint position statement: nutrition and athletic performance. *Medicine and Science in Sports and Exercise*, 48 (3) 543-568.
- Armstrong, N. & McManus A.M. (2011): The Elite Young Athlete. *Medicine Sport Science. Basel, Karger, vol 56, pp 47-58.*
- Trammell, J. (2007). Assessment of Hydration Knowledge, Attitude, Behaviors and Fluid Replacement Effectiveness of Collegiate Athletes. A Thesis Presented to the Graduate School of Clemson University. [https://tigerprints.clemson.edu/all\\_theses/86](https://tigerprints.clemson.edu/all_theses/86)
- Ayotte, D & Corcoran, M.P (2018). Individualized hydration plans improve performance outcomes for collegiate athletes engaging in in-season training. *Journal of the International Society of Sports Nutrition (2018) 15*: 27.
- Chevront, S.N & Kenefick, R.W (2017). Dehydration: physiology, assessment and performance effects. *Comprehensive physiology*, 4: 257-258.
- NaCCA (2019). Physical Education Curriculum for Primary Schools (Basic 1-6). Cantoment-Accra: Ministry of Education
- Racinais, S; Alonso, J. M, Coutts, A.J; Flouris, A. D; Girard, O González-Alonso, J; Hausswirth, C; Jay, O; Lee, J.K.W; & Mitchell, N (2015). Consensus recommendations on training and competing in the heat. *Sports Medicine*, 45(7):925-38.
- Bergeron, M.F; Bahr, R; Bartsch, P; Bourdon, L; Calbet, J.A.L; Carlsen, K.H; Castagna, O; González-Alonso, J.M; Lundby, C & Maughan, R. (2012). International Olympic Committee consensus statement on thermoregulatory and altitude challenges for high-level athletes. *British Journal of Sports Medicine (BJSM) 46(11)*, 770-779.
- Maughan, J.R. (2012). Hydration, morbidity, and mortality in vulnerable populations. *Nutrition Reviews*, 70(2): 152-155.
- Phillips, S. M., Sykes, D., & Gibson, N. (2014). Hydration Status and Fluid Balance of Elite European Youth Soccer Players during Consecutive Training Sessions. *Journal of sports science & medicine*, 13(4), 817-822.
- Torres-McGehee, T.M., Pritchett, K.L., Zippel, D., Minton, D.M., Cellamare, A., & Sibilila, M. (2012). Sports nutrition knowledge among collegiate athletes, coaches, athletic trainers, and strength and conditioning specialists. *Journal of athletic training*, 47 (2), 205-211.
- Abbey, L.E; Wright, C.J & Kirkpatrick. C.M (2017). Nutrition practices and knowledge among NCAA Division III football players. *Journal of the International Society of Sports Nutrition* 14(13) 1-9.
- Olufadi, Y; Soboyejo, A.B.O; Oloredo, K.O & Dauda, A.K (2014). Hydration Status in Nigeria: A Cross-Sectional Study. *Pakistan Journal of Nutrition*; 13(5), 243-254.
- Sedek, Razalee & Mohamad, Mohamad & Mohd-Kasim, Zalifah. (2015). Knowledge, Attitudes and Practices on Hydration and Fluid Replacement among Endurance Sports Athletes in National

- University of Malaysia (UKM). *Pakistan Journal of Nutrition*, 14, 658-665.
- [25] Kavouras, S.A; Bougatsas, D; Johnson, .E.C; Arnaoutis, .G; Tsipouridi, .S, & Panagiotakos, D.B.( 2017) Water intake and urinary hydration biomarkers in children. *European Journal of Clinical Nutrition*, 71(4): 530-535.
- [26] Patton-Lopez, M. M., Manore, M. M., Branscum, A., Meng, Y, & Wong, S. S. (2018). Changes in Sport Nutrition Knowledge, Attitudes/Beliefs and Behaviors Following a Two-Year Sport Nutrition Education and Life-Skills Intervention among High School Soccer Players. *Nutrients*, 10(11), 1636.
- [27] Patrícia Padrão, P; Neto,; Pinto, M; Oliveira, A.O; Moreira, A. & Moreira, P (2016). Urinary hydration biomarkers and dietary intake in children. *Nutricion Hospitalaria*; 33(3):35-40.
- [28] Jenus, S; Pital, P.P & Wahed, W.J.E (2017). Knowledge, Attitude and Behaviors Regarding Hydration and Hydration Status among Combat Sports Athletes. *Asian Journal of Business Management Studies* 8 (2): 33-36.
- [29] Esa, N.H; Saad, H. A; Phing, C.H, & Karppaya, H. (2015). Knowledge, attitudes and behaviours regarding hydration and hydration status of Malaysian national weight. *Journal of Physical Education and Sport (JPES)*, 15(2), 452-459.
- [30] Kant, A.K & Graubard, B.I (2010). Contributors of water intake in US children and adolescents: associations with dietary and meal characteristics—National Health and Nutrition Examination Survey 2005-2006. *The American Journal of Clinical Nutrition*, 92 (4), 887-896.
- [31] Badran, I.G (1995). Knowledge, attitude and practice the three pillars of excellence and wisdom: A place in the medical profession. *Eastern Mediterranean Health Journal*; 1: 8-16.
- [32] Eagly AH, & Chaiken S. (2007). The advantages of an inclusive definition of attitude. *Social Cognition*, 25; 582-602.
- [33] Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Harcourt Brace Jovanovich College Publishers.
- [34] Glanz, K; Rimer B.K & Lewis, F.M. (2002). *Health behavior and health education: Theory, research, and practice*. (3rd ed.) San Francisco: Jossey-Bass; International Publishers, New Delhi
- [35] Seidu, A. (2007). *Modern Approaches To Research in Educational Administration: Revised Edition*. Kumasi: Payless Publication Limited.
- [36] Kothari, C.R. (2004) *Research Methodology: Methods and Techniques*. 2nd Edition, New Age.



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