



The effect of energy drinks on attention aspects among football players

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Abstract

The main objective of the current study was to identify the effect of the use of energy drinks on the attention spans of football players. The researchers used the experimental method for its suitability to the nature of the study. Twenty-one players were selected from the second year students at the College of Physical Education and Sports Sciences at Salahaddin University-Erbil those practicing the game. They were divided into three groups (two experimental groups: the first experimental group used energy drinks that contained caffeine An average of 85 mg was given to each player., and the second experimental group used non- caffeinated energy drink non- caffeinated). As for the control group, they did not use any of the drinks, with 7 players per group. The totals were tested twice, the first time as a pre-test, and after two weeks passed, they were tested for the second time with the introduction of the dependent variable, and it was calculated as a post-test. Attention. The current study's findings on the efficacy of energy drinks in raising attention indicators in the sample and in favor of the two experimental groups in the aspects (focus, transformation, distribution, stability of attention).

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تأثير استخدام مشروبات الطاقة في مظاهر الانتباه لدى لاعبي كرة القدم

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- مشروبات الطاقة
- مظاهر الانتباه
- كرة القدم

الخلاصة: كان الهدف الرئيسي من الدراسة الحالية هو التعرف على تأثير استخدام مشروبات الطاقة على مظاهر الانتباه لدى طلبة المرحلة الثانية في كلية التربية البدنية وعلوم الرياضة - جامعة صلاح الدين - اربيل والممارسين للعبة كرة القدم في الاندية والفرق الشعبية . وقد استخدم الباحثون المنهج التجريبي لملائمته لطبيعة الدراسة. تم اختيار (21) لاعبا. وتم تقسيمهم الى ثلاث مجاميع (مجموعتين تجريبيتين :المجموعة التجريبية الاولى استخدمت مشروبات الطاقة التي تحتوي على مادة الكافيين وبنسبة 85 ملغم لكل لاعب ,والمجموعة التجريبية الثانية استخدمت مشروبات الطاقة التي لا تحتوي على الكافيين : اما المجموعة الضابطة فلم تستخدم اي من المشروبات ، وبواقع 7 لاعبين لكل مجموعة . تم اختبار المجاميع مرتين المرة الاولى كاختبار قبلي وبعد مرور اسبوعين تم اختبارهم للمرة الثانية مع ادخال المتغير التابع وحسبت كاختبار بعدي .اظهرت نتائج البحث الحالي عن فاعلية مشروبات الطاقة على زيادة مظاهر الانتباه لدى العينة ولصالح المجموعتين التجريبيتين في مظاهر (التركيز ,التحويل ,التوزيع ,ثبات الانتباه).

Introduction

In general, energy drinks may help to increase mental performance by lowering brain and body fat levels. They help the brain to stay alert and focused throughout the day. Caffeine and taurine, as well as other chemicals in energy drinks including beta-alanine and arginine, are largely responsible for the positive effects of energy drinks. Energy drinks are a category of beverages that are used by people to give them an extra burst of energy, stimulate wakefulness, and keep them alert. Ishak et al.(2012).regardless of using caffeinated or non-caffeinated Energy drinks promise to reduce mental tiredness and improve performance by keeping you alert and awake.Red Bull, Tiger, Monster Horse Power, and other energy drinks have

been widely employed in many sectors of life. Although most of these beverages are classified as being unsafe for exercise or as a pre-workout drink, some athletes take them as a stimulant before sports. These beverages have stimulant effects on the central nervous system (CNS) and are consumed with the expectation of boosting the user's physical and mental performance Oteri et al .(2007). Although there are two types of energy drinks (caffeinated and non-caffeinated), the majority rely on caffeine, taurine, l-carnitine, Sodium Citrate, Panax Ginseng Extract, carbohydrate, vitamins, and other herbal supplements such as guarana. Caffeine, found in coffee, tea, and soft drinks across the world, is one of the most widely ingested alkaloids, and large amounts can induce aberrant neurological system activation as well as severe effects on the cardiovascular, hematopoietic, and gastrointestinal systems. Seifert et al. (2011). Energy drinks are sold in more than 160 countries, and sales are increasing. Energy drinks contain caffeine, taurine and carbohydrates in the form of sugars as principal ingredients Heckman et al. (2010). The importance of the current study is to find out the effect of using those kind of energy drinks in attentions aspect .researchers assumed that those energy drinks would increase the cognition process in this study attentions aspects would be tested .

1-2 statement of the problem:

One of the most significant predictors of success is psychological elements and mental processes. Football is one of these games, and achieving the highest level of performance in any sport is challenging. When it comes to coping with the nature of skillful play, mental processes are a key pillar. Multiple and complicated tactical strategies, as well as game variables, match conditions, and location are all factors to consider. One of the elements that may have a role in stimulating the central nervous system that has a critical effect on attention is the use of energy drinks (caffeinated or non-caffeinated). So the statement of the problem could help answer the question: do energy drinks have an effect on attention aspects among footballers?

1-3 Research aims:

- 1- Identify the effect of energy drinks on attention aspects among football players.
- 2- Identify the effect of energy drinks types (caffeinated or non-caffeinated) on attention aspects among football players.

1-4 Research hypotheses:

- 1- Using energy drinks has a positive on attention aspects among football players.
- 2- There are significant differences among the groups (the experimental group who used caffeinated energy drinks, the experimental group who used non-caffeinated energy drinks, and the control group).

1-5 Research scopes: -

1-5-1 the human field: second year students of College of Physical Education and Sports Sciences - Salahaddin University – Erbil whom practicing football .

1-5-2 Time field: 26/4/2021 untill 16/5/2021

1-5-3 spatial field: main Hall in the College of Physical Education and Sports Sciences- Salahaddin University – Erbil.

2-1 Research methodology and field procedures

2-1-1 The Research Method: The researcher used the experimental method to suit the nature of the research problem.

2-1-2 the research community and its sample:

One of the considerations in scientific research is to select a sample that accurately reflects the original community, as the research community has determined by the second year students at College of Physical Education and Sports Sciences, Salahalddin University's in Erbil, those whom practicing the game in football clubs with a total of (21) players grouped into three categories (A, B, and C). The research sample was chosen using a basic random selection method, with each group consisting of seven (7) players. Group (A) was allocated to the experimental group that consumed caffeinated energy drinks, whereas group (B) was assigned to the experimental group that consumed non-caffeinated energy drinks, and group (C) was assigned to the control group (C).

The mean of their height were 173.44 cm with a standard deviation 12.34 ,and the mean of their weigh were 67.34 kg and standard deviation 8.17 .

Table No. (1)

It shows the experimental and control groups and the sample size

Group	Learning	Subjects
Experimental 1	consumed caffeinated energy drinks	7
Experimental 2	consumed none caffeinated energy drinks	7
Control	did not use energy drinks	7

2-1-3 Devices and tools used in the study

2-1-3-1 tools

1- Observation.

2- Attention aspects test.

3- Arabic and foreign resources.

4- Stop watch.

5- Calculator.

6- metrononm flasher device for measuring concentration.

2-2 The Borden-Enffimov test

This test is a form that contains 31 lines of Russian numbers. Each line contains (40) numbers, so the test contains (1240) numbers. The numbers in each line group are placed in a standardized manner, and each of them consists of 3 different numbers that are distributed and arranged to ensure that they are not preserved by the laboratory. For the purpose of calculating the various aspects of attention, the following must be known:

a = (the number of letters the player looked at during the test (general size)

b = the number of combinations he should cross out on the test paper.

Number of general errors (number of wrong combinations that was crossed out + number of compositions that did not.

B = cross out

r = number of integer combinations crossed out

e = coefficient of accuracy of work and execution of the test

$e = b - B / b$

Attention sharpness (the test is carried out in 1 minute)

Performance method

Quickly and accurately (C.B), the player had asked to turn the page and delete the composition.

Without errors and when signaling (stop), he refrains from continuing and sets a transverse condition at the stopping point is then calculated from:

Attention intensity $= u = ax.e$

1. Focus attention

Performance method

It is the same performance system as for attention sharpness, but here when a player strikes a cross.

A light signal is directed every five seconds, so the number will be 12.

(BC) The player in the current search crosses out syntax.

-How to calculate the focus of attention by it

It is the intensity of attention in a period of one minute without using a UI signal.

It is the intensity of attention in a period of one minute with the use of a traffic light, meaning U and that 2

The test is performed first without a light signal using optical signals and a calculation.

2. Distribution attention

Performance method

The performance of the intensity shortening is the same, in addition to:-

When the start signal is given and the stopwatch is turned on, the player starts searching and finishing- In one and the same previous method, it puts (Cx, xB) of

the two compositions diagonal line from top left to right. When hearing the word stop, the player puts a vertical line at the last finish he reached.

The test time is 2 minutes.

Attention distribution calculation method

$$C = (U_3 - U_4) 100 / (U_3 + U_4)$$

Whereas:-

(xB) Performance yield for installation

(Cx) Performance yield for installation

As in the intensity of attention.

$U = a \times e =$ productivity productivity

Divert attention

The test time is 2 minutes.-

Performance method.-

And for a period of one second, then with (CX) when indicated, the test begins by canceling the composition. For 30 seconds and (BC) the sign "about", the player moves to cross out the composition. And for another 30 seconds and then (CX) hearing "about" again moves to cross out Then the two minutes expire (BC) calculation for the third time "about" and the player crosses out.

3. Divert attention.

$$U = M + H + O / 3$$

U and the second 2 UI are equal to the difference between the labor productivity of the first 30 seconds, M, where

$$1 \ 2 \ M = U - U$$

U and third 3 U equal the difference between the productivity of second labor H 2

$$2 \ 3 \ H = U - U$$

The U and fourth U are equal to the difference between the productivity of third labor

$$O = U_3 - U_4$$

$$O = U - U$$

(CX) and labor productivity are calculated for a period of 30 seconds for each free installation in

In a section of the section, by the equation:- (Bc) and

As in Intensity of attention $U = axc$

3-3 the pilots study:

A pilot study is a short experiment or mini-work that a researcher does in order to discover the drawbacks and positives that may occur during the performance of the research's major experiment." Al-Shawk and Al-Kubaisi,(2006). The researchers conducted the exploratory experiment with the assistant work team at (9) am on Monday 26/4/2021 in the main Hall of the College of Physical Education and Sports Sciences, as one of the important procedures that the researcher undertakes

before carrying out the main experiment. This experiment's goal was to discover the challenges that come with testing, such as: - Validating the equipment and instruments utilized in the study - Training of the supporting team members on how to conduct the tests Ascertain that the timing of portions of instructional units is acceptable, as well as the extent to which they can be implemented. The participants were five students who were not a part of the main experiment , An average of 85 mg was given to each player.

3-4 the main experiment:

After conducted the pilot study, the researchers conducted the pretest for all the groups (experimental 1 and experimental 2 and the control group). The main experiment rolled with the assistant work team at (9) o'clock, 28/4/2021 in the main Hall of the College of Physical Education and Sports Sciences. And after two weeks the same procedures had done with a different approach (using energy drinks for both experimental groups 30 minutes prior to the experiment; Redbull for the caffeinated energy drink and Unleaded Monster energy drink for the non-caffeinated) while the control group just proceeded with no energy drinks or any other stimulation.

3-6 Statistical means:

The researchers processed the data statistically using the statistical package (SPSS) on the data through the following means:

- 1- The mean.
- 2- Standard deviation
- 3- MANOVA.
- 4- Tukey test.

4-1- Presentation and analysis of results

To determine the impact of utilizing using energy drinks on attention aspects among football practitioners at Salahalddin University – Erbil's College of Physical Education and Sports Sciences, the researchers have gathered the following data that showed in tables bellow ;

Table (1) shows the mean and standard deviation for all dependent variables

Group		Mean	Std. Deviation
Sharpness	A	81.0000	1.91485
	B	81.4286	2.14920
	C	81.2371	4.67348
	Total	81.2219	3.01171
Fixed	A	.7486	.03579
	B	.7800	.03162
	C	.7586	.02854
	Total	.7624	.03330
concentration	A	17.5357	.97106

	B	17.6014	.94406
	C	17.9657	.52491
	Total	17.7010	.81883
distribution	A	5.7586	1.45301
	B	5.3343	.87000
	C	5.3000	1.07957
	Total	5.4643	1.12061
Diverted	A	5.5714	1.51186
	B	5.5071	.85656
	C	4.9814	.62036
	Total	5.3533	1.04624

From Table (1) we notice the mean and standard deviations of the pre-test results for the experimental and control group for all the variables (sharpness, fixed, concentration, distribution, and diverted attention).

Tables (2) shows the F value for the depended variables for the pretest

Source	Dependent Variable	Type III Sum of Squares	Mean Square	F	Sig.
Group	sharpness	.645	.323	.032	.968
	fixed	.004	.002	1.749	.202
	concentration	.751	.376	.534	.595
	distribution	.913	.457	.340	.716
	diverted	1.467	.733	.646	.536

F value 0.05 with df (18, 2) = 3.55

Table (2) shows the F value for the depended variables for the pretest.as it appears there is no significant difference among the 3 groups and for all the variables .which means that all groups are equal in the test of attention aspects. The value of (F) for the pre-test attained is shown in the same table, indicating that there are no significant differences between the pretest and the two groups.

Table (3) shows the mean and standard deviation for all dependent variables

group		Mean	Std. Deviation
sharpness	a	83.0000	2.16025
	b	83.1429	1.67616
	c	80.1414	4.77773
	Total	82.0948	3.33130
fixed	a	.8129	.04536
	b	.8271	.03546

	c	.7757	.03047
	Total	.8052	.04203
concentration	a	19.1071	.65655
	b	18.5557	.74126
	c	18.1786	.43998
	Total	18.6138	.71056
distribution	a	6.9329	.79920
	b	5.9071	.67324
	c	5.5800	1.13533
	Total	6.1400	1.03104
diverted	a	6.9457	1.40997
	b	5.8757	.72730
	c	5.2243	.66216
	Total	6.0152	1.18972

Table (3) reveals the mean and standard deviation for all dependent variables of the study for the posttest for the dependent variables for the both experimental groups and the control group. And in order to find the differences among the groups, the researchers had used MANOVA to find out the significant.

Table (4) shows the F value for the depended variables for the posttest

Source	Dependent Variable	Type III Sum of Squares	Mean Square	F	Sig.
Group	sharpness	40.134	20.067	1.987	.166
	fixed	.010	.005	3.488	.052
	concentration	3.053	1.527	3.901	.039
	distribution	6.975	3.488	4.394	.028
	diverted	10.576	5.288	5.368	.015

F value 0.05 with df (18, 2) = 3.55

After running the analysis of (MANOVA) among the groups the test revealed a significant differences among them in all the dependent variables except for the (sharpness) where the F value were smaller compared to the other attention aspects. Since the F test shows the significant differences and in order to find out which group was getting more affected by the independent variable, the researchers have conducted post The post hoc (tukey's) test for the dependent variable attention distribution .

Table (4) the post hoc (tukey) for fixed attention

Group	A	B	C
(A) experimental	the mean = -----	-.0143*	.0371

1 the mean	.8129			
(B) Experimental 2	the mean = .8271	-----	-----	.0514*
(C) the control	the mean = .7757	-----	-----	-----

Tukeys value 0.05 = 0.047

Table (5) the post hoc (tukey) for concentration

group		A	B	C
(A) experimental 1 the mean	the mean = 19.1071	-----	.5514*	.9286*
(B) Experimental 2	the mean = 18.5557	-----	-----	.3771
(C) the control	the mean = 18.1786	-----	-----	-----

Tukeys value 0.05 = 0.94

Table (6) the post hoc (tukey) for attention distribution

group		A	B	C
(A) experimental 1 the mean	the mean = 6.9329	-----	1.0257*	1.3529*
(B) Experimental 2	the mean = 5.9071	-----	-----	.3271
(C) the control	the mean = 5.5800	-----	-----	-----

Tukeys value 0.05 = 1.34

Table (7) the post hoc (tukey) test for attention diversion

group		A	B	C
(A) experimental 1 the mean	the mean = 6.9457	-----	1.0700	1.7214*
(B) Experimental 2	the mean = 5.8757	-----	-----	.6514
(C) the control	the mean = 5.2243	-----	-----	-----

Tukeys value 0.05 = 1.50

4-2 discussing the results:

After conducting a (MANOVA) analysis among the groups, the test indicated significant differences in all dependent variables except (attention sharpness), where the F value was lower than the other attention characteristics. The researchers used a post-hoc (tukey) test for the dependent variable .since the F test revealed significant differences, and they wanted to know which group was most impacted by the independent variable. Therefore after conducting Tukey test among the three groups in for fixed attention the data revealed that the experimental group A which used caffeinated energy drinks were significant compare with the control group and the experimental group B which used non-caffeinated energy drink were significant to

control and group A and their means were in consecutive order were (.8129, .8271, .775) and Tukeys value $0.05 = 0.047$ in advantage for the experimental group B which used the non-caffeinated energy drink as showed in table 4.

As for the post hoc (tukey) for concentration our findings revealed that the experimental group A, which consumed caffeinated energy drinks, was significantly different from the control group, as well as the experimental group B, which consumed non-caffeinated energy drinks. Their means were in consecutive order were (19.1071, 18.5557, 18.1786) and Tukeys value $0.05 = 0.94$ in advantage for the experimental group A.as shown in table 5.

Table 6 shown attention distribution tukeys test data which the mean for the three groups were (6.9329, 5.9071, and 5.5800) and the Tukeys value $0.05 = 1.34$.there was a significant differences among the three group and in the favor of Group A which used caffeinated energy drink. (Tukey) test for attention diversion showed a significant differences among the groups and the both experimental groups surpassed the control group ,while there was not a differences between the both experimental groups .the mean of the groups respectively were (6.9457, 5.8757, 5.2243) ; Tukeys value $0.05 = 1.50$.as shown in table 7.

As we showed previously and through table (4,5,6,7) there was a significant effect of consuming energy drinks that contained caffeine and caffeine free as well .in table 4 the results indicated that energy drink with no caffeine showed more effective in fixed attention aspect ;the non-caffeine drinks contain (caffeinated Redbull can the ingredients are as followed: "Carbonated Water, Sucrose, Glucose, Citric Acid, Taurine, Sodium Bicarbonate, Magnesium Carbonate, Caffeine, Niacinamide, Calcium Pantothenate, Pyridoxine HCl, Vitamin B12, Natural and Artificial Flavors, Colors.

These ingredients could help to improve attention aspect and cognitive function. According to research, consuming certain nutrients and/or caffeinated beverages before exercise might enhance mental concentration and/or exercise ability without noticeable adverse effects in apparently healthy males. Both children with ADHD and adults who suffer from mental tiredness benefit from acetyl-L-carnitine. Ishak et al.(2012, Jung et al. (2017), Campbell et al.(2013), Monaghan e ,al.(2017), Van Oudheusden et al .(2002). Our findings suggest that some other stimuli (non-caffeinated) have a beneficial impact in enhancing cognitive function and, in particular, attention, which is consistent with the findings of earlier research.

And on the other hand energy drinks that contained caffeine has used widely not only in Redbull but in almost all the pre-workout products .Caffeine has a great role in stimulate the central nervous system which improves cognitive ability as well. Many studies have shown these positive effect on cognitive function .for example Seifert et al .(2011)found that , Caffeine, one of the most widely ingested alkaloids, and large amounts can induce aberrant neurological system activation as

well as severe effects on the cardiovascular, hematopoietic, and gastrointestinal systems. stimulant impact, which helps them concentrate, alertness, and respond faster.(Hoffman et al .2010).and in another study that conducted by Del Coso et al .(2012) found that ,During a simulated soccer game, a caffeine-containing energy drink at a level of 3 mg/kg enhanced the capacity to sprint repeatedly and the distance traveled at high effort. Furthermore, the caffeinated energy drink improved leap height, which might be beneficial for headers or when players are vying for a ball. Caffeine's basic function as an adenosine inhibitor is well understood, counteracting the inhibitory effects of this neurotransmitter while boosting the release of other neurotransmitters such as noradrenaline and dopamine, resulting in a mild stimulant and mood-enhancing effect. Davis et al. (2003); Ferré (2008); Huang et al. (2007); Landolt (2008); Sturgess et al. (2010). According to research, consuming certain nutrients and/or caffeinated beverages before exercising might enhance mental concentration and/or exercise ability. So, according to Campbell et al. (2013), to summarize , our finding in utilizing energy drinks/caffeinated or non-caffeinated, has a positive effect and might help the athletes perform better mental abilities such as attention and focus. In light of what was said before regarding prior research on this subject, we may say that our findings are consistent with them. Even so, we recommend conducting additional studies in a range of sports, not just football, and using larger samples.

5-1 Conclusions

- 1-Statistically significant differences between the three groups studied in this study.
- 2-In the attention fixed aspect, the experimental group that used non-caffeinated energy drinks was inhibited by the experimental group A that used caffeinated energy drinks and the control group.
- 3-In terms of concentration, the experimental group A repressed both the experimental group B and the control group, whereas the experimental group B suppressed the control group.
- 4-In terms of attention distribution, the experimental group A repressed both the experimental group B and the control group, whereas the experimental group B suppressed the control group.
- 5-In terms of attention diversion, the experimental group A suppressed both the experimental group B and the control group, whereas the experimental group B suppressed the control group.
- 6-There were no significant differences in attention sharpness across the groups.

5.2 Recommendations:

- 1-Ensure that using energy drinks in a reasonable amount may help the footballers in performing better in terms of cognitive function and motor skills
- 2-Conduct similar studies on different sports.
- 3-Conduct a similar study with a larger sample size.

2-Not to generalize the data of the current study.

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