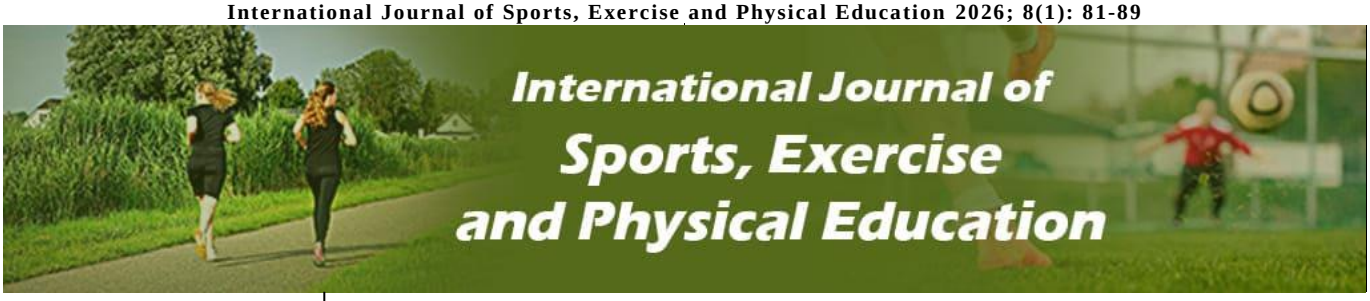

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The effectiveness of a training program accompanied by the supplement Ashwagandha in some biochemical variables and explosive strength of wrestlers

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Abstract
The current research aims to study the effectiveness of the explosive strength training program accompanied by the Ashwagandha herb supplement on some biochemical variables and explosive strength of wrestlers at the specialized center in Samawah. The sample was divided into three groups, totaling 21 wrestlers, with each group consisting of 7 participants. The first group followed the coach's program as a control group, the second group followed the explosive strength program prepared by the researcher, and the third group followed the program with the Ashwagandha herb supplement. The values that emerged for the research variables were for the explosive strength tests of the upper limbs (medicine ball) and the lower (Sargent test) and the results of blood lipid analysis and testosterone hormone. After being statistically treated using two-way ANOVA and Bonferroni, it became clear that there was an improvement in the variables between the pre-test and post-test. However, the results showed the superiority of the third group. The current study emphasized the necessity of considering the integration of training based on scientific foundations and the nutritional aspect, as they play an important role in enhancing the physiological and physical efficiency of the body. This paves the way for significant improvements in training programs that rely on physical and nutritional balance for weightlifting athletes and other sports.

Keywords: Ashwagandha supplementation, explosive strength, biochemical variables, testosterone, blood lipid profile

1. Introduction

1.1 Introduction to the Research and Its Importance

Scientific training in sports, based on a comprehensive scientific foundation, plays a significant role and has a clear contribution to enhancing the levels of physical fitness elements and physiological variables for athletes. The external load resulting from regular sports training is not limited to physical or mechanical performance alone, but it also has a wide importance in improving the levels of biochemical variables of the athlete, such as blood fats (HDL, LDL, TG3, Testosterone. H). These variables are just one of the precise indicators of the functional health of the individual. And his adaptive capacity to training loads and volumes. Whereas there are many studies that support training programs accompanied by safe nutritional supplements that effectively help in enhancing the internal efficiency of the athlete's body, as in the study by Belkredid, Walid, and Mouzoud, Mohamed Hadi "The Relationship between Nutritional Supplements and Muscle Strength Development." The aspects mentioned from the training and physiological side, in conclusion, work on improving both physical and skillful athletic performance, especially for wrestlers. The importance of the research lies in the effectiveness of the training program using free weights and various devices and Supported by a supplement of Ashwagandha herb at a dosage of 450mg per serving in some biochemical variables and explosive strength of wrestlers at the specialized center located in Samawah.

1.2 Research Problem

The researcher defined the research problem with a set of questions as follows:

1. Is the training program used in the research, accompanied by (Ashwagandha with weight

training weight training), effective in the explosive strength of the wrestlers' arms?

1. If there is a difference in the explosive strength of the arms, which group (the one that trained using Ashwagandha with weight training or the one that trained with weights only) has the advantage?
2. Is the training program used in the research, accompanied by (Ashwagandha with weight training weight training only), effective in improving the explosive strength of the wrestlers' legs?
3. If there is a difference in the explosive power of the legs, which group (the one that trained using Ashwagandha with weight training or the one that trained with weights only) has the advantage?
4. Is the training program used in the research, accompanied by (Ashwagandha with weight training - weight training only), effective in some biochemical variables of wrestlers?
5. If there is a difference in some biochemical variables of the legs, which group (the one that trained using Ashwagandha with weight training or the one that trained with weights only) has the advantage?
6. Does the duration of the training program (pre- and post-) have an effect on the explosive strength of the arms and legs and some biochemical variables of the wrestlers?
7. If there is an advantage for either group (the one that trained with weights and used Ashwagandha or the one that trained only with weights).

1.3 Research Objectives

The research aims to the following:

1. Identifying the effectiveness of the program used in conjunction with Ashwagandha on the explosive strength of the upper and lower limbs.
2. Identifying the effectiveness of the training program (using weight training with Ashwagandha and weight training) on some biochemical variables.
3. Identifying the preference in the duration in which the program was applied (pre- and post-) for either of the two groups (using weight training with Ashwagandha or those who trained only with weights).
4. To identify the effectiveness of the training program (using weight training with Ashwagandha and weight training) on the explosive strength of the arms and legs of wrestlers.
5. To identify the advantage in the duration in which the program was applied (pre-post) for either group (using weight training with Ashwagandha or those who trained only with weights).

1.4 Research Hypotheses

The research hypotheses are as follows:

1. The training program using weights and Ashwagandha herb - weights only is effective in some biochemical variables of wrestlers.
2. The training program using weights and Ashwagandha herb - weights only are effective in the explosive strength of the arms.
3. The training program using weights and Ashwagandha herb - weights only are effective in the explosive strength of the legs.
4. There is an effectiveness of the duration of applying the experimental program (pre - post) on some biochemical variables of the wrestlers.
5. There is an effectiveness of the duration of the experimental program (pre-test post-test) on the explosive strength of the wrestlers' arms.
6. There is an effectiveness of the duration of the experimental program (pre-test post-test) on the explosive strength of the wrestlers' legs.
7. There is an advantage for the group that trained using weights with Ashwagandha over the group that trained with weights only and the control group in some biochemical variables and the explosive strength of the wrestlers' legs and arms.
8. There is an advantage for the group that trained using weights over the control group in some biochemical variables and the explosive strength of the arms and legs of the wrestlers.

1.5 Research Areas

1.5.1 Human Field

Wrestlers of the Specialized Center in Samawah who have applied

1.5.2 Temporal Scope

11/11/2024-1/2/2025

1.5.3 Spatial Domain

Al-Zahra Forum in Samawah Science College Laboratories, Al-Muthanna University.

1.6 Terminology

Ashwagandha is an herb known as winter cherry, poison gooseberry, or sleepy nightshade. This supplement is extracted from its roots and is an evergreen tree from the nightshade family. The height of this tree is 75 cm, and its leaves are bell-shaped.

2. Research Methodology and Field Procedures.

The researcher used the experimental method due to its suitability for the nature of the research and to achieve its objectives.

Since the experimental method is considered one of the most rigorous methods in research, it is used to test hypotheses attributed to causes by organizing variables to determine the effect of the independent variable on the dependent variable. The appropriate design for this research was chosen, which the two-way general linear model (ANOVA) is.

As shown in Table (1) below

Table 1: shows the ANOVA design

Group 3	Group 2	Group 1	Test
P1	P1	P1	Test First
P2	P2	P2	
P3	P3	P3	
P4	P4	P4	
P5	P5	P5	
P6	P6	P6	
P7	P7	P7	
P1	P1	P1	Last Test
P2	P2	P2	
P3	P3	P3	
P4	P4	P4	
P5	P5	P5	
P6	P6	P6	
P7	P7	P7	

2.1 Research Population and Sample

The researcher identified the research community, which consists of the specialized center in Al-Samawah for wrestling, with a total of 21 wrestlers aged 18-20 years.

The researcher divided the community into three intentionally selected groups, each consisting of 7 wrestlers: two experimental groups and one control group. The researcher assigned the groups according to the method used to ensure the equivalence and homogeneity of the sample, and they were as follows.

- **Group One (Experimental):** The training program used weights accompanied by the Ashwagandha herb supplement.
- **Group Two (Experimental):** Used the training program with weights only.
- **The third group (control):** The trainer's regimen.
- **Exploratory trial sample:** The exploratory sample was selected using stratified random sampling, with one wrestler from each group, totaling (3).
- **Standardization sample:** The standardization sample was also selected using stratified random sampling, where the total number was (3) wrestlers, one from each group, for the purpose of standardizing the tools used in the research. Where the standardization sample was combined with the survey sample, bringing the total number to (12).

2.2 The Pilot Study

Before conducting the main experiment, it is very important for the researcher to ensure the nature of the tests to match the capabilities of the sample. This involves examining the tools used, adjusting the required time, collecting all information related to the tests and measurements, and identifying potential difficulties the researcher might face. This is achieved thru the pilot study. Under this context, the researcher conducted the pilot study on (11/11/2024) on a sample from within the current researcher's sample, which consisted of three wrestlers. And also three wrestlers for the purpose of standardization. As stated in Table No. (2).

The exploratory experiment aimed at the following

- Examining the tools that will be used in the tests
- Establishing the appropriate time duration for the test procedures
- Controlling the problems that the researcher might face during the tests and the nature of the measurement
- Explaining and clarifying the program's components and the nature of the training it covered.
- Modifying the study design and its implementation mechanism if necessary.
- Ensuring the calculation of the scientific foundations for the tests: validity, reliability, and objectivity.

Table 2: shows the size of the community according to the designed groups

Groups	The total number for each group	pilot test sample	standardization sample	number of wrestlers participating in the experiment	The nots
The first experiment	7	1	1	7	The standardization sample differs from the survey sample in individuals
The second experiment	7	1	1	7	
The control	7	1	1	7	
The total	21	3	3	21	

2.3 The tests adopted by the researcher in the current study.

2.3.1 Physical Tests

The physical tests were determined to measure the explosive strength of the upper and lower limbs of wrestlers by relying on sources and references specific to physical tests.

First

The medicine ball throw test with a 3-kilogram ball using both hands for the farthest possible distance. Each participant in the sample is given three attempts, and the average is taken.

Secondly: Vertical jump test from a standing position: A test that measures the vertical explosive power of the leg muscles (thigh - calf).

The score is calculated according to the following equation.

Highest jump - static stretch = vertical jump

255-200 = 55 cm

2.3.2 Biochemical Tests: The biochemical variables were selected based on sources and references related to the physiology of the individual athlete, where the researcher decided to choose the research variables for the dependent variable (biochemical) as shown in Table No. (3).

Table 3: shows the biochemical variables of the current research

Biochemical variable	Unit of measurement	
LDL	Mg\dl	1.
HDL	Mg\dl	2.
Triglycerides	Mg\dl	3.
T-TESTOSTERON	Nmol\l	4.

2.4 Scientific Foundations of the Test

Test validity

The researcher used convergent validity, where the explosive strength test for the lower and upper limb muscles was presented to a group of judges (five in total) to express their opinion on the validity of the test for measuring the phenomenon (explosive strength tests). The agreement rate among the judges was very good, reaching 100%, with a validity degree of 0.97, which is higher than 0.62. This indicates the test's validity, as shown in Table 4.

Table 4: shows the validity of the two tests (explosive strength of the lower and upper limbs)

Exams	Repetition	Truthfulness
Throwing a 3 kg medicine ball	5	0.97
Vertical jump from a standing position	5	0.97

Test reliability

A stable test is one that shows high consistency in results when repeated under the same conditions and time, meaning it yields the same or similar results for the test subject if the test is repeated under the same conditions. If the test is not stable, it cannot be relied upon for measurement because it produces unstable results and is affected by various factors, making the results unsuitable for scientific research. And to conduct the test reliability, the researcher relied on (f) for correlation, where the results showed a significance level (f) with a correlation coefficient less than 0.05 significance level, which indicates On the test's stability.

Table 5: One-Way ANOVA Results for Explosive Strength Tests

Test	Consistency Value	Calculated F	Significance Level
Throwing a 3 kg medicine ball	0.11	1.732	0.866
Vertical jump from a standstill	0.06	4.521	0.778

Objectivity of the test: Objectivity is the degree to which the test results are independent of the person who is conducting the correction or evaluation. That is, when the tool gives almost the same result whether it is corrected by one person or a group. The research extracted the objectivity of the tests used in the study thru the agreement coefficient between the judges' results. To ensure the significance of the correlation, the researcher used the F-test for significance, where the p-values associated with the correlation coefficient were less than 0.05. This indicates that there is a correlation between the judges, meaning that the two tests have high objectivity, as shown in Table (6).

Table 6: shows the objectivity of the tests

Test	The value of the agreement	Calculated F	Significance Level
Throwing a 3 kg medicine ball	0.01	1.732	0.921
Vertical jump from a standstill	0.00	4.521	0.830

Pre-tests

The purpose of the pre-tests is to assess the level of the research sample consisting of 21 advanced wrestlers and to measure the physical variables (explosive strength of the lower and upper limbs) as well as the biochemical variables (bad cholesterol, good cholesterol, triglycerides, and testosterone) before applying the proposed training program by the researcher accompanied by the Ashwagandha supplement. The physical tests were conducted on (15/12/2024), corresponding to Sunday, in the hall of the College of Physical Education and Sports Sciences at Al-Muthanna University, taking into account all conditions to avoid external influences that could affect the results. The tests for explosive strength of the legs included the vertical jump test after providing instructions before performing the test, applying a uniform warm-up for all sample members, and giving three attempts for each tester and calculating the average for them. As for the explosive strength of the upper limbs, the medicine ball throw test with a 3 kg ball was conducted with both hands from behind the head, measuring the farthest horizontal distance according to the same calculation criteria as the vertical jump.

As for the biochemical tests, the measurements were as follows: The biochemical tests were conducted in the laboratory of the College of Science, Department of Biology, Al-Muthanna University, two days after the completion of the physical tests.

First: Blood lipids: Measured using the c311 cobas device (lipid profile) before taking the blood for examination. The researcher instructed the sample individuals to fast for 8 hours from eating and drinking, except for water, to ensure the accuracy of the test and to avoid temporary food influence. Where a blood sample was drawn from the vein, usually from the arm, approximately 5 ml, and placed in a tube, and the following variables were analyzed:

Triglycerides

High-density lipoprotein (HDL) cholesterol

Low-density cholesterol

Thirdly, testosterone hormone. Testing testosterone hormone for all sample individuals after drawing a venous blood sample, then placing it in a tube and transferring it to a centrifuge to separate the blood components. Then, 75 microliters of it are drawn and placed in a special solution in a specific tube, mixed for 10 seconds to combine the serum with the solution, and then placed in a device. It is left for 15 minutes, transferred to an incubator, and placed inside a finecare device for reading.

2.5 The training program and the use of the Ashwagandha supplement: The researcher implemented the training program after the pre-test using weights (barbell and weights - dumbbells - cable machines). The exercises were for the upper and lower limbs, divided into three training sessions per week. To maintain the development of explosive strength and avoid injuries, the sample began with a controlled stretch for each exercise. From 60% and progressing to 85% of maximum intensity with repetitions ranging from 5-6 for 4 sets, while rest periods were between 15-30 seconds and between sets 2-4 minutes to ensure ATP-CP recovery and control neural fatigue for optimal explosive performance. As for the doses, the undulating method was used with low intensity, then high, then medium throughout the week and the entire program. As for the training program in terms of duration, it extended to 10 weeks as

shown in Plan (1). As for its sections, the preliminary section is the warm-up first, the main section is the exercises with 5 exercises per dose second, and the concluding section is the cool-down and stretching exercises third. Using the Ashwagandha herb supplement: one capsule of Ashwagandha extract at a dose of 450 mg daily before bedtime, two hours before sleep, with a light meal, while ensuring to drink an adequate amount of water. Knowing that the sample is adhering to a unified diet to maintain the weight category.

2.6 Post-test: After completing the training program using Ashwagandha and the weight training program, the researcher immediately conducted the physical tests on the first day and recorded the results. On the second day, the same procedures were applied as in the pre-test for measuring biochemical variables on 9-10/2/2025.

2.7 The researcher used the SPSS statistical package to extract the research results.

3. Presentation, analysis, and discussion of the research results

3.1 Presentation, Analysis, and Discussion of Explosive Strength Variables for Upper and Lower Limbs.

Table (7) shows the mean and standard deviation of the pre-test and post-test for the three research groups regarding explosive power (legs).

Table 7: Values of the mean and standard deviation for the main effects

Standard deviation	Mean	Group	Test
1.46	42.14	1.00	The south
1.15	42.00	2.00	
1.35	42.14	3.00	
1.30	42.09	total	
0.95	43.29	1.00	The immortality process
2.64	49.43	2.00	
1.80	53.71	3.00	
4.27	48.81	Total	
1.21	42.71	1.00	Total
4.76	45.71	2.00	
4.68	47.93	3.00	
6.38	45.45	Total	

Table (7) presents the results of the standard deviations and means for the explosive strength variable of the legs (Sargent) for the three experimental and control research groups, for the pre- and post-measurements of each group, for all groups, and for the total. And there may be a benefit from the arithmetic means to determine the direction of the effect. The pre-test means were (42.14, 42.0, 4.12), while the post-test means were (43.29, 49.43, 53.71) respectively. There may be a benefit from the arithmetic means to determine the direction of the effect.

3.2 Table (8) shows the mean and standard deviation of the pre-test and post-test for the three research groups for explosive strength (upper limbs).

Table 8: Values of the Mean and Standard Deviation for the Main Effects

Standard deviation	Mean	Group	Test
1.46	42.14	1.00	The south
1.15	42.00	2.00	
1.35	42.14	3.00	
1.30	42.09	Total	
0.95	43.29	1.00	The immortality process
2.64	49.43	2.00	
1.80	53.71	3.00	
4.27	48.81	Total	
1.21	42.71	1.00	Total
4.76	45.71	2.00	
4.68	47.93	3.00	
6.38	45.45	Total	

Table (8) presents the results of the standard deviations and means for the variable of explosive arm strength (3 kg medicine ball throw) for the three experimental and control research groups, for the pre- and post-measurements of each group, all groups, and the overall total. And there may be a benefit from the arithmetic means to determine the direction of the effect. The pre-intervention means were (42.14, 42.0, 4.12), while the post-intervention means were (43.29, 49.43, 53.71) respectively. There may be a benefit from the arithmetic means to determine the direction of the effect.

Table 8.1: shows the Levene's value for the explosive strength variables of the legs and arms for the three research groups.

Variable	Degree of freedom		Levene value	Levels of significance
Sergeant	17	2	0.306	0.308
Medicine ball throw	17	2	0.360	0.474

Table (8.1) presents the Levene's test for the variables of explosive strength of the legs and arms, where it was shown that there is homogeneity of variance since the significance value is greater than the error level of 0.05.

Table 9: Analysis of Variance for Main Effects and Interaction

Source of variation	Sum of Squares	Degrees of Freedom	Mean Square Error	F	P-value
The groups	250.75	2	125.37	25.75	0.01
Measurement (Pre-test - Post-test)	180.5	1	180.50	210.42	0.01
Interaction (pre-test - post-test)	98.20	2	49.10	18.64	0.01
Error	45.30	18	2.52	25.75	

Thru Table (9), there are differences between the three groups for the factor (pre-test - post-test period). Additionally, there is a significant and statistically meaningful change in the pre-test - post-test measurement, favoring the post-test for each group. There is also a statistically significant interaction for the entire group in the pre-test - post-test, indicating that the measurement period differs between the groups

Table 10: Results of the Bonferroni Test for Comparing Strategies

Control	Deferent mean	Standard error	P-value	Confidence interval 95%	
				Minimum	Maximum
Group1-group2	4.07	1.45	0.027	0.37	7.77
Group1-group3	5.29	1.45	0.004	1.58	8.99
Group2-group3	1.12	1.45	0.624	2.49-	4.92

It is noted in Table (10) for the Bonferroni test of the Sergeant test that the difference between the first group and the second and third groups was statistically significant. This means that the first group differs from them, indicating a preference for the latter at the expense of the first. However, the difference between the second and third groups was not significant, indicating that there are no differences between them, as the third group showed the highest average, making it the best in the Sergeant test for explosive leg strength

Table 11: Analysis of Variance for Main Effects and Interaction

Source of variation	Sum of Squares	Degrees of Freedom	Mean Square Error	F	P-value
The groups	6.00	2	3.000	6.00	0.029
Measurement (Pre-test - Post-test)	4.500	1	4.500	9.00	0.045
Interaction (pre-test - post-test)	3.000	2	1.500	3.00	0.098
Error	9.000	18	0.500		

From Table (11) above, it is clear that the measurement period (pre-test - post-test) has a significant effect, meaning there is a difference between the two measurements, and the groups also have the same effect. As for the interaction between the measurement and the groups, it is not significant, which indicates that the effect of the measurement does not differ significantly between the groups. In the medicine ball throw test (explosive strength of the arms).

Table 12: Bonferroni test results for comparing strategies

Control	Deferent mean	Standard error	P-value	Confidence interval 95%	
				Minimum	Maximum
Group1-group2	7.07	1.62	0.002	3.63	10.51
Group1-group3	11.14	1.62	0.000	7.52	14.76
Group2-group3	4.07	1.62	0.04	0.98	7.16

Thru Table (12) above for the Bonferroni test, we notice a statistically significant difference between the three groups, indicating that one or more of them differ in the mean significantly. Where the second group had an advantage over the first, and the third group had an advantage over the first, and there was a difference between the third and second groups, with the third group having the advantage. Thru this test, it was shown that the third group had the advantage in the average for the arm muscle strength test (medicine ball throw).

Table 13: Values of the Mean and Standard Deviation for the Main Effects (Biochemical Variables)

Biochemical Variable	Group	Pre-intervention Mean	Pre-intervention SD	Post-intervention Mean	Post-intervention SD
HDL	1	43.43	1.40	49.86	0.90
	2	42.00	1.63	53.57	1.27
	3	43.00	2.00	55.14	6.17
	Total	42.18	3.52	55.14	6.17
Triglyceride	1	192.75	4.86	175.14	2.73
	2	189.43	1.90	132.57	1.90
	3	189.17	2.29	92.43	1.72
	Total	192.57	4.86	175.14	2.73
LDL	1	133.14	1.21	121.86	1.46
	2	132.43	1.40	112.86	1.35
	3	132.14	1.46	82.43	1.62
	Total	132.57	1.36	105.72	1.48
Total Testosterone	1	4.07	0.043	4.30	0.032
	2	4.15	0.034	5.11	0.017
	3	4.31	0.026	5.05	0.044
	Total	4.176	0.035	5.153	0.031

Thru Table (13), the statistical description of the biochemical variables, means, and standard deviations is evident. The pre-intervention means for the HDL variable for the groups were (43.43, 42.00, 43.00) and post-intervention (49.86, 53.57, 62.00) respectively. As for TRIGLYCERID (192.57, 189.43, 189.71) and post-intervention (175.14, 132.57, 92.43). For the LDL variable (133.14, 132.43, 132.14) and post-intervention (121.86, 112.86, 82.43). And for the TOTAL.TESTOSTERONE variable (4.07, 4.15, 4.31) and post-intervention (4.30, 5.11, 6.05) respectively. And the values of these means are of great importance in interpreting the direction of the effect.

Table 14: Levene's test value and its significance level

Variable	Degree of freedom		Levene value	Levels of significance
HDL	2	19	0.770	0.905
Triglycerid	2	19	3.01,	0.0745
LDL	2	19	0.956	0.54
Total.Testosteron	2	19	2.14	0.14

Table 15: Analysis of Variance for Interaction Effects of Biochemical Variables

Variable	Source	Sum of Squares	df	Mean Square	F	Probability (p)
HDL	Groups	202.67	2	101.33	40.39	0.000
	Measurement period (pre-post)	1569.00	1	1569.00	598.94	0.000
	Interaction	279.57	2	139.79	106.76	0.000
	Error	30.12	—	2.51	40.39	0.000
TG3	Groups	60218.38	2	30109.19	1490.44	0.000
	Measurement period (pre-post)	43989.29	1	43989.29	3362.24	0.000
	Interaction	6405.14	2	3202.57	489.81	0.000
	Error	242.46	24	20.20	—	—
LDL	Groups	3117.57	2	1558.79	5.50	0.008
	Measurement period (pre-post)	219.43	1	219.43	0.77	0.385
	Interaction	91.00	2	45.50	0.16	0.852
	Error	10199.14	19	283.2	—	—
Total TSH	Groups	51.48	2	7.74	426.3	0.001
	Measurement period (pre-post)	161.98	1	161.98	8923	0.001
	Interaction	0.37	2	0.18	9.81	0.001
	Error	0.50	19	0.03	—	—

Thru Table (15), the two-way ANOVA analysis for the three research groups on biochemical variables shows that the results did not reveal any statistically significant differences in the beneficial cholesterol variable among the three groups, as the probability value (0.252) is higher than the significance level. However, there are highly significant statistical differences between the pre-test and post-test measurements of the groups, as the probability value is lower than the significance level, reaching 0.001. There is also a statistically significant interaction between the measurement period and the group, indicating that the effect of the intervention was different across all groups, as the p-value was less than the significance level (0.041). As for cholesterol (low-density lipoprotein), there was no statistically significant difference between the groups with a p-value of (0.436), which is higher than the significance level. However, the differences were significant and high between the pre- and post-measurements of the groups with a p-value of (0.001). As for the statistically significant interaction between the measurement period and the group, it means that there is an effect of the intervention on harmful cholesterol, which varied between groups under a probability value of (0.022), which is greater than the significance level. As for the variable of triglycerides, the p-values between the groups and the pre-measurements were (0.216, 0.533), but the differences were statistically

significant between the measurement period and the group, indicating that the intervention effect on this variable varied significantly between the groups. As for testosterone, the differences were statistically significant in its levels with probability values between the groups and between the pre-test and post-test, favoring the post-test. Additionally, there was an interaction between the measurement period and the group, indicating that the intervention had a significantly different effect on this variable between the groups. The values came in succession as (0.001, 0.001, 0.001). Knowing that the significance level is (0.05). Interpretation. LDL is observed thru the ANOVA table, where the p-value for the groups was (0.008), which is less than 0.05. This indicates the presence of significant differences, where some achieved better improvement than others. On the other hand, there is no significant difference between the pre-test and post-test (measurement period) in general across all groups. There is also no interaction effect, meaning the improvement during the measurement period does not differ significantly between the groups.

Table 16: Bonferroni test results for comparing strategies (HDL)

Control	Deferent mean	Standard error	P-value	Confidence interval 95%	
				Minimum	Maximum
Group1-group2	1.15	0.16	0.160	0.36-	2.66
Group1-group3	6.14	0.75	0.000	4.20	8.08
Group2-group3	5.00	0.86	0.001	2.23	7.47

Regarding Table (16), we observe that there are no differences between the first and second groups because the p-value is higher than 0.05, meaning there is no difference. However, between the first and third groups and between the second and third groups, there were significant differences in favor of the third group in the post-test. The preference in Bonferroni was for the group that used the Ashwagandha supplement and weight training in the beneficial cholesterol variable.

Table 17: Results of the Bonferroni test for comparing strategies (TRIGLYCERID)

Control	Deferent mean	Standard error	P-value	Confidence interval 95%	
				Minimum	Maximum
Group1-group2	4.46	0.001	20.69	41.89	4.46
Group1-group3	6.41	0.000	72.29	102.57	6.41
Group2-group3	8.49	0.000	37.19	75.09	8.49

Table 18: Results of the Bonferroni test for comparing strategies (LDL)

Control	Deferent mean	Standard error	P-value	Confidence interval 95%	
				Minimum	Maximum
Group1-group2	9.00	0.75	0.001	7.36	10.64
Group1-group3	39.43	0.82	0.001	37.63	41.23
Group2-group3	30.43	0.80	0.001	28.70	32.16

However, Table (18) shows that there is a preference for the second group over the first group, as well as a preference for the third group over the second and third groups. This means that the third group is the best, followed by the second, and then the first in the variable of harmful cholesterol

Table 19: Results of the Bonferroni test for comparing strategies (TESTOSTERON)

Control	Deferent mean	Standard error	P-value	Confidence interval 95%	
				Minimum	Maximum
Group1-group2	0.81	0.02	0.001	-0.86	-0.76
Group1-group3	1.75	0.02	0.001	-1.80	-1.70
Group2-group3	0.94	0.02	0.001	-0.99	-0.89

Where the greatest effectiveness was found between the control group and the second experimental group (first group - third group), this indicates a significant and clear difference between the three groups, with the third group, which underwent training and used the Ashwagandha supplement, showing an increase in testosterone levels.

Overall Conclusion: Based on the results of the current study, it was evident that the applications of the weight training program, which included free weights and various cable machines, were conducted on a scientific basis of regulated intensity, monitored and re-regulated, along with general warm-up exercises, transitioning to specific ones, relaxation, and flexibility after the training dose again for the wrestlers, led to a noticeable improvement in the explosive strength of the arms and legs, as well as biochemical variables (high-density cholesterol, low-density cholesterol, triglycerides, and testosterone) But the third experimental group excelled according to the study after statistically processing the values. The researcher attributes this superiority to the training program designed to develop explosive strength, supported by the Ashwagandha supplement at a daily dose of 450 mg. Thus, it becomes clear that the combination of the prepared training program and this herb has a cumulative effect that enhances the body's response to exercises more than training alone.

Conclusions

The explosive strength training programs, designed according to sound scientific principles and within the framework of sports training rules, play an effective role in

developing explosive strength variables and biochemical variables, which in turn prepare the athlete's body to be fully ready for athletic performance.

Supporting training programs with an appropriate nutritional and herbal supplement enhances the physiological responses in physical activity.

The clear phase of the group that trained according to the training program accompanied by Ashwagandha indicates an increased adaptability of the sample individuals to cope and then adjust to the training intensities and volumes.

The Ashwagandha herb used as a supplement is not the main factor but rather an auxiliary one that contributed to the development of the studied variables.

The differences that appeared in the research results among the three research groups indicate the importance of the integration between training and nutrition in developing elements of physical fitness, especially explosive strength.

Recommendations

- The necessity of using a comprehensive training program that considers the scientific, training, and nutritional aspects under the supervision of specialists.
- Conducting comprehensive tests, especially biochemical variables (blood lipids, testosterone hormone), due to their impact on the activity and sports training of wrestlers and athletes in general.
- Disseminating knowledge about the use of Ashwagandha supplements in sports that require physical strength, such as wrestling, under safe dosages and avoiding excessive consumption.
- The necessity of paying attention to nutrition and its importance as a significant aspect during sports training, not just a small and secondary part.
- Research can be conducted in this field on larger sample sizes and for longer durations to determine the effectiveness of safe herbal supplements with long-term training.

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