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The Effect of Special Exercises in some Biochemical Variables and the Technical Performance of the Front Bow Skill on the Mat of Ground Movements in the Artistic Gymnastics for Women

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Abstract--- *The development in the sport of gymnastics is the result of the progress made on the technical and research levels that helped athletes in performing difficult and complex skills through which they won many Olympic decorations, and since most of the skills of gymnastics require a complex motor structure, and bow skill is an important skill in gymnastics, so therefore Trainers and teachers are required to formulate and develop comprehensive educational and training curricula to develop most of these skills. Through the researchers 'follow-up to the lessons of the technical gymnastics, as a teacher of the gymnastic subject, they noticed a problem that lies in the poor performance of female students in the front arc skill on the floor of the movements of the floor. The performance. The research objective to:*

1. *Developing special exercises to improve some biochemical variables and the technical performance of the front bow skill on the floor of the students' ground movements.*
2. *Knowing the effect of special exercises on some biochemical variables and the technical performance of the front bow skill on the mat of the ground movements of the students.*

The research community has identified the third stage students, Department of Physical Education and Sports Science, College of Education for Girls, University of Kufa for the academic year (2018-2019), and the number is (25) students. Accordingly, the research sample was chosen from that community by (20) students.

1. *There is a positive effect of special exercises and stomach on scientific basis in the development of some biochemical variables of the skill of the front arc on the ground of the movements of the ground.*
2. *The special exercises proved their effectiveness in developing biochemical variables in all stages of the skill (preparatory, main, and final). The technical performance of the front arc skill on the ground of the ground movements.*

Keywords--- *Special Exercises, Biochemical Variables, Artistic Gymnastics.*

I. INTRODUCTION

The difficulty and complexity in learning the skills of gymnastics and achieving a good level of performance needs to unite all the common factors in preparation and implementation to achieve a satisfactory level of

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performance that depends only on increasing training or educational units, which necessitated the trainers to put special exercises directed at the service of technical performance. This does not come except through kinetic analysis, which has a great role in developing the sport of gymnastics in accordance with the physical laws of the forces affecting movement, it works to find appropriate solutions for the kinetic act and give it the correct form in directing the technique of movement towards the right path, as well as determining the kinetic range For the correct method, using the appropriate force according to the corners of the body and the balance required to implement the kinetic act and its mastery.[1]

As the instructor or teacher cannot accurately judge the correctness of the performance by observing only whatever his training capabilities and field experiences are great, and what requires the recording of motor skill with video filming, which provides an opportunity to repeat the observation at any time without the player suffering from repetition of the movement to make the observation upon it Using slow display or when installing the image, and for the purpose of developing technical performance in this game, it requires workers in this field to know the weaknesses that permeate the stages of performance through kinetic analysis and then work to overcome them by finding the right and appropriate solutions to them.[2]

The close relationship between achieving biomechanical conditions and performing gymnastic skills depends primarily on the corners of the joints of the body when performing any skill, especially those that depend on maintaining the kinematic path of the center of gravity of the body and maintaining the balance of the player's body on the device as the kinetic performance of the front bow skill depends on a balance The female body on the floor mat device. Hence the importance of research lies in the knowledge and development of some biochemical variables and the kinetic aspects of the skill by preparing special exercises, which depend on the direct correlation between biomechanics and gymnastics because they contain a dynamic path of the body, and what is achieved by the flow and kinetic path of the body parts when the kinetic performance of the skill.[3]

Research Problem

It is only sufficient knowledge of the information related to technical performance, whether from anatomical or mechanical, one of the essential ingredients in the success and development of skill performance and the diagnosis of errors and processing to reach the ideal performance.

Through the researchers ’follow-up to the lessons of the technical gymnastics, as a teacher of the gymnastic subject, they noticed a problem that lies in the poor performance of female students in the front arc skill on the floor of the movements of the floor. the performance. The front bow skill on the ground movements is one of the basic skills upon which most of the difficult skills are built, in which payment and kidnapping are due to the specificity of this device and its legal specifications, and that learning this skill will lead to learning other new skills more difficult, in addition to achieving most of the requirements for these devices It is a type of skill that needs balance and stability on the machine.

Therefore, the researchers deliberately prepared special exercises and using auxiliary tools to improve some of the biochemical variables affecting skill education in order to reach them to better performance.

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II. RESEARCH METHODOLOGY AND FIELD PROCEDURES

Research Methodology

The researchers used the experimental approach to design the two control and experimental groups, with pre- and post-tests, for their convenience to the nature of the research.

Research Community and Sample

The research community has identified the third stage students, Department of Physical Education and Sports Science, College of Education for Girls, University of Kufa for the academic year (2018-2019) and the number (25) students. In fact, the research sample was chosen from that community by (20) students after excluding the absent students, and one of the two groups was chosen to be the experimental group and the other is the control group and by lot, each group includes (10) students and thus the percentage of the research sample is (80%) And that proportion is appropriate for a true and sincere representation of the research community.

Homogeneity of the Research Sample

The results showed that the sample is homogeneous by the skewness coefficient values which are less than (± 1) as in Table (1).

Table 1: Shows the Mean, the Standard Deviations and the Skewness Coefficient for the Purpose of Homogeneity of the Sample in the Variables (Age, Height, and Weight)

Variables	***Units***	***Mean***	***SD***	***Median***	***Skewness***
Age	Year	21.20	1.32	21	0.656
Length	Cm	161.6	5.52	160	0.745
Mass	Kg.	61	7.63	60.50	0.557
Intelligent	Degree	20.333	1.751	19.500	0.919

The value of the torsional coefficient is limited to (±1), which indicates a moderate distribution of the sample.

Procedures to verify the equivalence of the two research groups

Table 2: Shows the Equivalence of the Two Research Groups

Variables	Control group		*Experimental group*		*(t) calculated*	*Sig. value*	*Levine test*	*Type of indication*
	Mean	*SD*	*Mean*	*SD*				
Knee angle	137.100	4.630	136.800	5.007	0.139	0.891	0.080	0.781
Hip angle	147.200	4.541	146.600	4.377	0.301	0.767	0.079	0.782
Shoulder angle	137.800	3.225	138.100	3.755	0.192	0.850	0.076	0.785
Knee angle	99.600	4.274	99.700	4.270	0.052	0.959	0.002	0.965
Hip angle	150.900	3.635	150.500	3.472	0.252	0.804	0.107	0.747
Shoulder angle	154.500	4.089	153.600	3.978	0.499	0.624	0.011	0.918
The maximum height of Body's Center of Gravity from the ground	41.400	2.459	41.800	2.201	0.383	0.706	0.190	0.668
The angular velocity of the feet	132.500	3.749	132.100	4.332	0.221	0.828	0.097	0.759
The horizontal distance between the arms and legs	61.000	5.657	61.500	5.276	0.204	0.840	0.117	0.737
Knee angle	103.500	5.603	103.600	5.522	0.040	0.968	0.005	0.947
Hip angle	185.500	8.822	185.000	9.592	0.121	0.905	0.062	0.805
Shoulder angle	158.800	7.569	158.400	7.947	0.115	0.910	0.068	0.797
Total performance time	2.378	0.425	2.272	0.500	0.511	0.616	0.146	0.706

After completing the distribution of the sample to two groups and for the purpose of equivalence of the two

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research groups, treatment of pre-tests for the two groups was achieved in order to maintain the integrity of the research and reach accurate results as shown in Table (2), as the results showed the equivalence of the two groups using the test (t).

III. FIELD RESEARCH PROCEDURES

Determination of biochemical variables[4]

The biochemical search variables of the front arc skill on the ground movement were determined through reliance on resources as well as the researchers' experience.

Front bow skill test on the floor motions mat[5]

- Name of the test: Measuring the technical performance of the front bow skill on the ground movements
- The objective of the test: to evaluate the technical performance of the skill
- The used tools: Floor Movements Mat - Performance Appraisal Form
- Performance specifications: From the standing position and after hearing the starting signal, the student performs the front bow skill on a mat and starts from standing on the hands, making the bow, and ending with the standing position.
- Method of registration: Two attempts are given to each student to perform the skill (and take the best), and they are presented to the (4) arbitrators, the highest and lowest degrees are deleted and the remaining two average degrees are taken and the evaluation is of (10) degrees.

Pilot Study

This pilot study was conducted on (5) female students on Sunday, corresponding to (7-10-2018) in the gymnasium hall of the Department of Physical Education and Sports Science, College of Education for Girls, University of Kufa, and it was a mini-experiment similar to the main experience, and the goal of this experiment was Inform the assistant team about the nature of work and procedures, and learn about all the negatives and obstacles that the researchers may encounter when conducting the main experiment.

IV. THE MAIN EXPERIENCE

Pre Tests

Two teaching units were given, with the help of the material school, about the skill under discussion under the supervision of the researchers. The video and live presentation were used. The information is not communicated to the students well and clearly, on Sunday and Tuesday, 14 and 10/16/2018.

Evaluation of the level of technical performance

The technical performance level of the skill was evaluated on the basis of a form prepared by the researchers. Each student was given two attempts and selected the best attempt. A committee was used to evaluate the performance of experts and specialists.

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Special exercises and their application

The researchers have prepared special exercises aimed at improving biochemical variables and the technical performance of the front bow skill on the floor of the ground movements. Special exercises were applied to the individuals of the experimental research sample in the first semester of the year (2018-2019), the educational curriculum consisting of (12) weeks began, and was divided into two lectures and unit time (90) minutes divided into three sections (main and final preparatory) applied Exercises in the main section amount to (70) minutes (20) educational minutes and (50) minutes. My application is the time allotted for the exercises, taking into account the level of the research sample and their capabilities, this is with regard to the experimental group, and the researchers took into account many things during the implementation of special exercises.[6] The most important of them is the principle of gradation from easy to difficult as well as using Encouragement and motivation in the course of performance. As well as benefit from the opinions of experts and specialists in the areas of dynamic learning and technical gymnastics. As for the control group, the vocabulary of the curriculum used by the school was applied in the same period. After completing the prescribed period for the educational curriculum, the educational units were completed on Sunday (12/15/2018).

Post-test

After completing the implementation of the vocabulary of the special exercises on the experimental sample, the technical dimensional performance tests for all members of the research sample in the control and experimental groups, on Wednesday (20-12-2018), taking into account the following method and the same conditions that took place in the pre tests in terms of time factors Location, tools, and devices used.

Statistical means

To extract search results, the researcher used the statistical bag (SPSS).

V. RESULTS

Table 3: Show The mean and standard deviations show the mean differences, deviations and value (t) and the level of significance for the values of the biochemical variables of the experimental group in the pre and posttests of the front arc skill on the mat of ground movements

Variables	*Pretest*		*Posttest*		*Mean diff.*	*SD diff.*	*(t) calculated*	*Sig. value*	*Type of indication*
	Mean	*SD*	*Mean*	*SD*					
Knee angle	136.800	5.007	159.8	11.641	23	12.454	5.840	0.000	Sig.
Hip angle	146.600	4.377	165.2	10.758	18.6	8.072	7.287	0.000	Sig.
Shoulder angle	138.100	3.755	156	8.459	17.9	7.724	7.329	0.000	Sig.
Knee angle	99.700	4.270	137.4	26.319	37.7	25.850	4.612	0.001	Sig.
Hip angle	150.500	3.472	171.8	6.861	21.3	7.072	9.525	0.000	Sig.
Shoulder angle	153.600	3.978	171.5	6.115	17.9	6.173	9.170	0.000	Sig.
The maximum height of Body's Center of Gravity from the ground	41.800	2.201	51.6	7.516	9.8	7.829	3.959	0.003	Sig.
The angular velocity of the feet	132.100	4.332	147.1	15.206	15	15.599	3.041	0.014	Sig.
The horizontal distance between the arms and legs	61.500	5.276	48.9	6.173	12.6	8.809	4.523	0.001	Sig.
Knee angle	103.600	5.522	115.2	10.685	11.6	8.656	4.238	0.002	Sig.
Hip angle	185.000	9.592	199.9	18.823	14.9	19.174	2.457	0.036	Sig.
Shoulder angle	158.400	7.947	184.9	15.906	26.5	9.443	8.875	0.000	Sig.
Total performance time	2.272	0.500	2.870	0.170	0.598	0.413	4.574	0.001	Sig.

Moral under significance level ≥ 0.05 degrees of freedom (9)

In the light of the data extracted for the members of the experimental group, Table (3) shows the differences in

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the values of the biochemical variables affecting the skill of the front arc on the ground of the ground movements in the pre and posttests of the experimental group. , Hip angle, shoulder angle), and for the main stage variables, as the results were significant for the variables (knee angle, hip angle, shoulder angle, angular velocity of the feet, horizontal distance between the legs and arms, the maximum height of (Body's Center of Gravity) What are the variables of the final stage of the skill (knee angle, hip angle, shoulder angle, total performance time)? The results were significant in all skill stages by finding the value (t) calculated between the pre-test and the post-test and comparing it with the level of significance at (0.05) And degree of freedom (9).

Table 4: Show the Mean, standard deviations, mean calculated mean differences, deviations and value (t) and the level of significance of the values of the biochemical variables of the control group in the pre and posttests of the foreground skill on the mat of ground movements

Variables	*Pretest*		*Posttest*		*Mean diff.*	*SD diff.*	*(t) calculated*	*Sig. value*	*Type of indication*
	Mean	*SD*	*Mean*	*SD*					
Knee angle	137.1	4.63	151.1	4.408	14	5.270	8.4	0.000	Sig.
Hip angle	147.2	4.541	156.3	3.917	9.1	5.607	5.133	0.001	Sig.
Shoulder angle	137.8	3.225	149	2.708	11.2	5.138	6.893	0.000	Sig.
Knee angle	99.6	4.274	116.7	11.285	17.1	13.228	4.088	0.003	Sig.
Hip angle	150.9	3.635	154.9	7.141	4	7.071	1.789	0.107	Non. Sig.
Shoulder angle	154.5	4.089	157.7	3.802	3.2	5.922	1.709	0.122	Non. Sig.
The maximum height of Body's Center of Gravity from the ground	41.4	2.459	43.3	2.312	1.9	3.071	1.956	0.082	Non. Sig.
The angular velocity of the feet	132.5	3.749	129.6	11.167	2.9	11.865	0.773	0.459	Non. Sig.
The horizontal distance between the arms and legs	61	5.657	54.9	3.143	6.1	7.279	2.650	0.026	Sig.
Knee angle	103.5	5.603	94.3	7.875	9.2	10.412	2.794	0.021	Sig.
Hip angle	185.5	8.822	171.6	16.181	13.9	20.572	2.137	0.061	Non. Sig.
Shoulder angle	158.8	7.569	157.2	12.822	1.6	7.720	0.655	0.529	Non. Sig.
Total performance time	2.378	0.425	2.601	0.193	0.223	0.303	2.331	0.045	Sig.

Moral under significance level ≥ 0.05 degrees of freedom (9)

In light of the data extracted for the members of the control group, Table (4) shows the differences in the values of the biochemical variables affecting the performance of the skill of the front arc on the ground of the ground movements in the pre and posttests of the control group. Knee, hip angle, shoulder angle), as for the main stage variables as the results were significant for the variables (knee angle, angular velocity of feet, horizontal distance between the legs and arms) not significant (hip angle, shoulder angle, maximum R Reaction to (Body's Center of Gravity))

As for the variables related to the final stage of the skill (knee angle, total performance time) and not significant for the variables (hip angle, shoulder angle) at all stages of the skill by finding the value (t) calculated between the pre-test and the post-test and comparing it with the level of significance at (0.05) and freedom degree (9) .

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Table 5: Show the mean and standard deviations show the mean differences, deviations and value (t) and the level of significance for the values of the biochemical variables of the control and experimental groups in the post-test of the front arc skill on the floor motions mat

Variables	*Control group*		*Experimental group*		*(t) calculated*	*Sig. value*	*Type of indication*
	Mean	*SD*	*Mean*	*SD*			
Hip angle	156.300	3.917	165.200	10.758	2.458	0.024	Sig.
Shoulder angle	149.000	2.708	156.000	8.459	2.492	0.023	Sig.
Knee angle	116.700	11.285	137.400	26.319	2.286	0.035	Sig.
Hip angle	157.000	6.733	171.800	6.861	4.869	0.000	Sig.
Shoulder angle	157.700	3.802	171.500	6.115	6.061	0.000	Sig.
The maximum height of Body's Center of Gravity is more than	43.300	2.312	51.600	7.516	3.338	0.004	Sig.
The angular velocity of the feet	129.500	11.188	147.100	15.206	2.948	0.009	Sig.
Horizontal distance of arms and foot	54.900	3.143	48.900	6.173	2.739	0.013	Sig.
Knee angle	94.300	7.875	115.200	10.685	4.979	0.000	Sig.
Hip angle	155.200	11.272	199.900	18.823	6.443	0.000	Sig.
Shoulder angle	157.200	12.822	184.900	15.906	4.288	0.000	Sig.
Total performance time	2.601	0.193	2.870	0.170	3.301	0.004	Sig.

Moral under significance level ≥ 0.05 and degree of freedom (18)

In the light of the data extracted for the members of the experimental group, Table (5) shows the differences in the values of the biochemical variables affecting the performance of the front arc skill on the mat of ground movements in the post and posttests of the experimental group and the control and as shown in the table above we find that the results were significant for the variables of the preparatory stage (Knee angle, hip angle, shoulder angle). As for the main stage variables, the results were significant for the variables (knee angle, hip angle, shoulder angle, angular velocity of the feet, horizontal distance between the legs and arms, the maximum of The height of the (BODY'S CENTER OF GRAVITY) (as for the variables related to the final stage of the skill (knee angle, hip angle, shoulder angle, total performance time). The results were significant in all skill stages in favor of the experimental group by finding the value (t) calculated between the test Post-test and post-test and compare it with the significance level at (0.05) and freedom degree (9).

Table 6: Shows the mean, standard deviations, mean differences, deviations, calculated value (t) and level of significance to evaluate the performance of some skills in your gymnasium for the experimental group

Variables	*Pretest*		*Posttest*		*Mean diff.*	*SD diff.*	*(t) calculated*	*Sig. value*	*Type of indication*
	Mean	*SD*	*Mean*	*SD*					
The front bow is on the floor of the floor	5.55	1.25	7.35	1.08	-1.60	0.39	3.40	0.00	Sig.

Table 7: Show the mean, standard deviations, mean calculated differences, deviations and value (t) and level of significance for assessing skill performance for the control group

Variables	*Pretest*		*Posttest*		*Mean diff.*	*SD diff.*	*(t) calculated*	*Sig. value*	*Type of indication*
	Mean	*SD*	*Mean*	*SD*					
The front bow is on the floor of the floor	5.20	0.94	6.20	0.91	1	0.47	2.62	0.02	Sig.

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Table 8: Show the mean, standard deviations, mean calculated differences, deviations and value (t) and the level of significance for the skill performance evaluation between the control and experimental groups

Variables	*Control group*		*Experimental group*		*(t) calculated*	*Sig. value*	*Type of indication*
	Mean	*SD*	*Mean*	*SD*			
The front bow is on the floor of the floor	6.20	0.91	7.35	1.08	2.56	0.02	Sig.

VI. DISCUSSIONS

We notice from Table (3), we find that there are significant differences with statistical significance between the pre and posttests and in favor of the post test of the experimental group in all the biochemical variables. The researchers attribute this development to special exercises and the use of aids, as a result of the focus in the formulation of exercises on opening the corners of the body to reach the state of the full extension and giving a period of time to correct the technique caused by the appropriate height and try to maintain it even in the stage of standing on the hands and going down the arch and directing the students to the need to tighten the muscles of the arms Because of its great impact on bearing the impact momentum, the researcher emphasized the treatment of weakness in the strength of the arms by some special exercises within the teaching unit.[7]

As for the variable angle of the hip, the researchers believe that the corners of the knee and hip joints should be straight at the moment of attachment, the shoulders, trunk, and embarrassing leg on one straightness. The appropriate angles that the student takes when performing the skill, and the researchers attribute this development, which happened to the effectiveness of special exercises, including the devices and tools of auxiliary tools, including spongy and triangular cutting tools, as they worked to improve performance by Diagnostics precise conditions of the body (arms, torso, legs) and corners work.[8]

As we note from the same table, we find that there are significant differences with statistically significant between the pre- and post-tests and in favor of the post-test of the experimental group in all the biochemical variables (the main stage variables). As for the hip angle variable at this stage and the inclination is not significant in the light of the change in the height of this sponge According to the stages of skill learning, if the first adult height (1.95 m) helps to fully support the body from standing on the hands, and after that the height of the sponge segment is reduced, which requires the student at this stage to adjust in proportion to the position of the body, and in the last stage is The descent stage after pushing the height of the sponge piece has been reduced to (50 cm) to reach the level of the hip joint and in the stage the angle and inclination of the body are corrected when performing, and thus this led to the development of the angle of the hip angle in the post-test as it positively reflected on the balance of the body during the skill performance of the group Pilot, and this improved the balance of the students, but the use of glove and trampoline as one of the auxiliary tools has increased control of the body's movement and the development of balance control during the performance of the skill, and the balance of movement affects the level of performance, it helps to increase the speed of The complex aspects and help be performed easily and smoothly and the best level of technical performance and hence there will be noticeable results in performance and access to an advanced level depends on the growth aspects of the job and the mechanical balance of the individual [9].

As for the angle of the shoulder joint, there were significant differences in the pre and posttests and for the

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experimental group due to the special exercises that focused the exercises using the aids to help develop weak muscles, including the muscles of the arms, as well as strengthening the weak areas in the light of exercises and reaching the level of dynamic control, i.e. Choosing the best positions, and this is the basis for maintaining the stability of the body [10], as the occurrence of any angle in the shoulder joint will lead to a loss of energy and then will lead to a decrease in the final result of the forces and this negatively affects the main goal of the skill.

As for the variable of the maximum height of the center of gravity of the body from the ground from the arch, we note that there are significant differences in favor of the posttest with respect to the experimental group, due to the special exercises that helped increase the susceptibility of the trunk muscles and that is by stretching and stabilizing the muscles with the tilt of the backward with confirmation of the survival of the center of gravity In an arched position, higher than the level of the shoulder and legs, and the curvature of the curve of the trunk, and this deliberates on a large portability of the muscles, after the stage of pushing the free man the body becomes curved and draws the arc of flight, and it is an ideal specification for the motor path that the center of gravity of the body travels So, at the lowest horizontal distance from the rise point to the landing point, and using the glove method to obtain the largest value of kinetic energy as it gives more impetus to the hands when applying exercises and then raising the center of gravity of the body, and the value of the vertical velocity vehicle in the phase of progress is crucial in determining the height that The body reaches it over the glove, "and the center of gravity is the point around which the body's weight is distributed equally in all directions. It has a great importance in analyzing the movement of bodies. This relationship is represented in the distribution of these parts around the center of gravity of the body. When the body is free, the center of gravity is its balance point"[11].

Also, noting the appropriate height of the center of gravity of the body in the various stages of movement has had a profound effect in raising the motor path of the body and thus the student’s control and giving him an opportunity to prepare for the next stage of performance, and its height can be developed by the means used by the researchers, and because the skill has difficulty in performing as This formed an obstacle to learning, especially in the stage of descent, as well as fear of injury during performance, as the researcher worked on the use of spongy pieces for prevention and helps to remove fear and hesitation during the performance of the means from a cylindrical piece of shape and sponges of various dimensions, and it helped to differ P Dimensional control the body's center of gravity, and then work to find a suitable height for better performance during the descent.[12]

As for the variable of the horizontal distance between the arms and legs, we note that there are significant differences in favor of the posttest with respect to the experimental group because the technical performance of the skill is determined by a number of mechanical variables, including the distance builds the hands and feet if the full performance of this skill requires a strong, fast and effective push in the arms in the stage of standing and the bowing of the arc requires a time period Suitable for obtaining the best path for the center of gravity of the body and the extension of the body to obtain the optimal drop and this is what helped in obtaining advanced results after emptying the data between the results of the two tests and in favor of the post-experimental group due to the role of exercise Special, which includes exercises, including the three signs and correcting the errors represented by bending the angle of the hip and knee to increase its speed at the stage of descent after the push is the final stage or the stage of descent and return to the primary position, after which the educated or the student starts to open the

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corners of the joints and extend the body as much as possible during the preparation, not a disease Skill. The special exercises designed to open the angle of the shoulder, which led to the distance of the hands from the raised leg point because the occurrence of any angle in the shoulder joint will make the movement of a low height in the center of the body weight as well as maintaining the angle between the trunk and arms, and that placing the hands on the ground must to be relatively far from the rising man to give birth to an angle that affects the main objective of the skill.[13]

As for the angular velocity variable for the feet, the researcher attributes this significant difference in the experimental angular velocity to the direct relationship between the angular velocity and the transmission angle, as the latter increased due to the opening of the shoulder angle, and the average velocity of the angular is affected by the difference in the radius of rotation where the relationship is inverse between them, so the student must take advantage of this relationship to obtain the highest angle velocity, and through special exercises, then focus on the two men's weighted speed to obtain a suitable arc for skill performance.[14]

As for the overall time variable of performance: significant differences emerged between the pre and posttest and in favor of the dimension of the experimental group as time decreased and the reason for that should be short because it will ultimately lead to movement will be faster and with a better arch where the hands pushing to the ground should coincide with or be present A quick weight of the two men to obtain the correct (BODY'S CENTER OF GRAVITY) to serve all skill sections of the skill, and this was confirmed during the use of some special exercises.[15]

As we note from Table (4) with regard to the control group (the preparatory stage) (hip angle, shoulder angle), there are significant differences between the cardiac and posttest tests and the post-valid test at this stage, the reason for that difference is due to the correcting of the motor pathway by giving feedback during After applying the skill and working to adjust the angle of the hip and open the joints of the body. As for the main and final stage is the stage of descent after payment, we note that there are no statistically significant differences and the researchers attribute the reason for that to the nature and type of exercises used in the approach followed and the lack of use of auxiliary means and their lack of influence in developing these variables as they are no longer in accordance with the principles and mechanical foundations. As for the variable for the maximum height of the center of gravity of the body from the ground from the arc and the variable between the arms and feet there were no significant differences between the pre and posttests due to the difficulty at this stage of skill and the inability of female students to perform and reach the limited use of devices and tools within the curriculum followed by a school Article, as for the time, non-significant differences appeared due to the lack of special exercises that treat weaknesses and imbalances in the application of the biochemical variables affecting the teaching of the skill of the bow.[16]

As for the post-tests between the experimental and control groups, which were presented in Table (5) and were significant in favor of the experimental, the researchers attribute the cause to this general improvement of all biochemical variables and the reason is generally due to the exercises in particular, which were within the auxiliary means so the means worked to develop the skill clearly, and that Stomach exercises had an effect in improving more than one variable, and this shortened the time in carrying out the vocabulary of those exercises as a direct result of

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the effectiveness of special exercises. Also, noting the appropriate height of the center of gravity of the body in various stages of movement had an extreme impact The correction of the body's kinematic pathway and thus the player's control and giving it an opportunity to prepare for the next stage of performance and in the stage of descent as it invested through the body's acquisition of kinetic and potential energy which contributed to maintaining the flow of performance and its beauty until the end of the movement, and the emphasis was on strengthening the strengths of the forces related to the appropriate work angles And the conditions for the individuals of the sample in the optimal way to apply the exercises, which were used by the experimental research sample, which contributed to reaching a positive stage of performance based on the principles and mechanical foundations through the realization of the dynamic path leading to a state of Mobility and investing physical ability to develop the skillful side while performing the movements. While the effect was specific to the control sample, which used exercises in the educational curriculum prepared by the school, the subject.[17]

As for the knee angle variable, the researchers attribute the reason for this to the effectiveness of the aids in the special exercises used, which led to an increase in the extension of the joint and the strengthening of the muscles of the leg, as the kinetic energy obtained by the student is obtained in the preparatory stage, without absorption of this energy as a result of bending Knees and hip where whenever the bending was simple, the faster and better the tide, and therefore, there was no stopping for a long time on the rug. Thus, obtaining a reaction force from the rug is very high. The stroke is pushed to the law of payment: pushing force = force x time [18]. A difference appeared morally between the control group and the experimental group and in favor of the experimental, as time decreased and the reason for this is because time must be short, because it will ultimately lead to movement going faster and a better disembarkation, where the pushing of the hands to the ground must coincide or agree with a weighted presence Fast men with two legs to get the right flight to serve the main skill section. This was confirmed during the use of some special exercises. The reason for obtaining this result is most of the special exercises that were applied to the experimental group, which were adopted in formulating them to address weaknesses and imbalances in the application of the biochemical variables affecting the teaching of the front arc skill, which directly affected the speed of education, as this improvement is the result From continuing education based on the principles of motor analysis, which helps to accurately detect the defect of these variables.

Through what came from Table (6), the results showed that there were significant differences for the cardiac and posttest tests, and for the benefit of the post-test of the experimental group of the skill in question. The instruction, the feedback feed (all the information that an individual gets as a result of performing a specific activity in order to improve performance in the field of kinetic learning) [19], worked on correcting mechanical errors when performing the movement, which directly affected the speed of skill learning in light of the opening of the joints of the Body as wide as possible.

Through what came from Table (7) with respect to the control group, the results showed that there were significant differences for the cardiac and posttest, and for the benefit of the post test for the skill in question, then the role of the school of the subject and the educational units that were applied to the group showed a clear improvement in learning in the post test.[20]

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Through the results of the post-tests, there are differences between the control and experimental groups and in favor of the experimental group. The reason is due to the superiority of the sample members of the experimental group in assessing performance compared to the control group that the proposed special exercises that the researchers relied upon to formulate defects and weaknesses in the application of biochemical variables affecting education And the performance of the front bow skill, which directly affected the speed of the skill learning, as this improvement is a result of continuing education based on the basis of kinetic analysis, which helps in revealing the defect of this subject He accurately and periodically gave an indication to the researcher in the ability to devise appropriate and necessary exercises to evaluate performance variables and work to correct the mechanical situation to the noticeable improvement in kinetic manifestations and studied biochemical variables, due to the effect of using the methods in special exercises to improve and develop the skill, and that the presence of assistive methods helped greatly in breaking The barrier of fear and anxiety from injury and a feeling of confidence among students during the performance, which made them perform the skill better and a good mechanical situation free from unwanted excess movements when performing the skill, and that the technical performance This skill has a high kinetic speed, and at the moment of pushing with the hands,[21]the body of two forces shines on one of them vertically resulting from the descent of hands on the ground the body weight and the other is horizontal resulting from the horizontal speed of the learner, and he likes that the horizontal force not overtake the vertical because the descent of the hands on the ground represents a force of action while responding The action will be towards the horizon and on one line of action according to Newton's third law (for each reaction a reaction equal to the magnitude and opposite to the direction) [22], the skill will be low, and the kidnapping and stopping of the kidnapping of the two men will be large so that there is no height to the center of gravity of a large body working to reduce Horizontal force and for it to continue Performance at high speed, and thus develop and improve the performance better, and according to what is required.[23]

VII. CONCLUSION

1. There is a positive effect of special exercises and stomach on scientific basis in the development of some biochemical variables of the skill of the front arc on the ground of the movements of the ground.
2. The experimental group made a noticeable progress in some biochemical variables in all skill stages (preparatory, main and final) (angle of knee, hip, shoulder, maximum height of (Body's center of gravity)) from the ground, the angular velocity of the feet, the horizontal distance between the arms and feet , Total performance time) for the front bow skill on the floor motions mat compared to the control group.
3. The special exercises proved their effectiveness in developing biochemical variables in all stages of the skill (preparatory, main, and final). The technical performance of the front arc skill on the ground of the ground movements.
4. The use of (assistive aids) with special exercises has proven its efficiency in correcting the correct motor pathway. The results have shown the effectiveness of using exercises related to the skillful performance of the skills under discussion.

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