

Directing Some of the Indicators to Improve the Biomechanical Performance of the Plane Attack in the Epee

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Abstract: The research aims to design a training program in light of the proposed indicators to improve the biomechanical performance of the plane attack in the epee. The research sample (8 epee and saber fencer); search tools and precision measuring device resulted in that the proposed training program had a positive impact in terms of morale indicators biomechanical of the attack aircraft and the training and ballistic vehicle. The training program helped to develop force rapidly and consequently led to increase the speed and momentum. Also, improving the muscles working in the legs helped to increase the momentum during the beginning of the of aviation.

Key words: Biomechanical performance % Plane attack % Epee

INTRODUCTION

In fencing, specifically epee and saber, we find that when the expansion occurs in a distance of jousting between epee fencer, sometimes the deliberate distance from an epee fencer due to its unique length of the parties to the other fencer becomes an opportunity for the implementation of the attack plane. But despite the opportunity for a dueling for the implementation of the attack plane on the swordsman, the other feared their implementation sometimes fear defend the opponent and do a counter-attack (blow off) for example and this is confirmed both by previous studies [1, 2]. This attack usually cannot be used to appeal to reach the goal of competition, where the opponent out of the reach swordsman thereby acting to gain time and distance using this movement and the player must choose the right time to implement them and to avoid not keeping pace with the movement of individual arm which facilitates the performance of the two counter-attack on the player who is on implementation [1, 2].

Based on the foregoing, the researcher has a previous study during which he analyzed the performance of bio-mechanics attack aircraft in the sport of fencing foil weapon to the best of the Egyptian national team players and the Registrar of the Egyptian Federation of Fencing biomechanical indicators were identified for the attack and

then the percentage contribution of each of these indicators was determined to improve the accuracy of performance through predictive mathematical equations to represent the scientific basis for guiding the accuracy of performance attack aircraft.

Here, the researcher believes that the scientific importance of this research lies in an attempt to direct these biomechanical indicators which got the highest rates of contribution to improve the accuracy of performance through a training program to improve the performance of the proposed attack aircraft in the epee.

Aim of the Research: Designing a training program in light of the proposed indicators to improve the biomechanical performance of the plane attack in the epee.

The Research Sample: Research sample was selected intentionally in 12 epee fencer from El-Shams Sports Club, over 17 years, where 4 epee fencer were selected of them for surveys, thereby applying the basic experiment on 8 epee fencer.

Measurement Tribal: The researcher conducted measurements tribal in research laboratory and consulting sports building, Faculty of Physical Education for Boys, Zagazig University, Egypt on Monday, 14/3/2011.

Application of the Training Program: The application of the proposed training program on the sample was in the period from Sunday 20/3/2011 to Thursday 12/5/2011, any for eight weeks with three training modules in the week.

Dimensional Measurement: The dimensional measurements of the experimental group in the same terms and conditions of tribal measurements were after the expiration of the application program directly and on Sunday 15/5/2011.

RESULTS AND DISCUSSION

Results for the Moment the Start of Flight: It is shown in Table 1 the existence of statistically significant differences between the measurements tribal and post the sample in the variables displacement horizontal of the basin left, displacement horizontal of the basin right, displacement spin-off of the basin right, displacement vertical to the left knee, displacement horizontal foot left, displacement horizontal blade, a moment beginning of the flight, Where the value of (T) calculated greater than the value (T) indexed at the level of significance 0.05, as evidenced by the existence of differences is statistically significant between the two measures in the remaining variables and

because the researcher these differences to the proposed training program using the training quality, which is similar to the muscular work with the requirements of performance skills at the same track for the motor skill under study and that work on the development of some of the physical attributes of the sport of fencing such as strength and speed in order to boost the ability of the fencer to get the maximum contraction of muscle in less time, as evident in the sign of the differences between the measurements tribal and post in the variables of displacement horizontal of the basin left, displacement horizontal of the basin right in the proposed training program, which contains a set of training quality which helped to control the body position with the ground during the moment of the beginning of aviation as evident in the delayed left front foot hitting the ground to the body of the situation ideal for horizontal flight, which had a positive impact on increasing horizontal displacement of the basin the right and left.

As shown in Table 1, sign of the differences between tribal and dimensional measurements in variable displacement incidental right, where the researcher believes that the accidental displacement of the basin the right moment for the beginning of the flight is a natural result of the movement of the rear foot in front of the

Table 1: Significant differences between tribal and dimensional measurements of the horizontal and vertical offsets of the biomechanical indicators selected during the moment of the beginning of aviation (n1 = n2 = 8)

Biomechanical variables	Pre-measurement		Post-measurement		Value (T)
	Mean	Deviation	Mean	Deviation	
Horizontal displacement of the basin left	1.258	0.003	1.304	0.002	2.667*
Accidental displacement of the basin left	0.610	0.002	0.608	0.022	0.112
Vertical displacement of the basin left	0.940	0.001	0.933	0.014	0.656
Horizontal displacement of the basin right	1.0254	0.007	1.36	0.002	3.872*
Accidental displacement of the basin right	0.321	0.008	0.432	0.003	2.826*
Vertical displacement of the basin right	0.903	0.02	0.905	0.012	0.303
Horizontal displacement of the left knee	1.619	0.003	1.639	0.019	0.394
Accidental displacement of the left knee	0.608	0.001	0.608	0.001	0.009
Vertical displacement of the left knee	0.637	0.011	0.659	0.014	3.13*
Horizontal displacement of the right knee	0.975	0.001	1.062	0.042	1.552
Accidental displacement of the right knee	0.479	0.014	0.528	0.055	0.503
Vertical displacement of the right knee	0.505	0.014	0.508	0.001	0.231
Horizontal displacement of the left foot	1.353	0.011	1.551	0.008	4.283*
Accidental displacement of the left foot	0.589	0.004	0.595	0.004	0.218
Vertical displacement of the left foot	0.248	0.002	0.261	0.003	0.437
Horizontal displacement of the right foot	0.686	0.001	0.781	0.03	1.60
Accidental displacement of the right foot	0.497	0.022	0.559	0.059	0.56
Vertical displacement of the right foot	0.011	0.001	0.021	0.004	0.362
Horizontal displacement of the blade	3.147	0.008	3.303	0.002	4.306*
Accidental displacement of the blade	0.302	0.023	0.369	0.003	1.081
Vertical displacement of the blade	1.403	0.003	1.409	0.002	0.266

The value of T indexed at 0.05 and degrees of freedom 7 = 2.3646

Table 2: Significant differences between tribal and dimensional measurements of the horizontal and vertical speeds of biomechanical indicators selected through the moment of the beginning of aviation (n1 = n2 = 8)

Biomechanical variables	Pre-measurement		Post-measurement		Value (T)
	Mean	Deviation	Mean	Deviation	
Horizontal displacement of the basin left	3.05	0.141	3.567	0.102	3.51*
Accidental displacement of the basin left	0.92	0.25	1.667	0.949	1.537
Vertical displacement of the basin left	0.298	0.156	0.105	0.57	2.836*
Horizontal displacement of the basin right	2.639	0.188	3.361	0.243	4.724*
Accidental displacement of the basin right	0.728	0.215	0.146	0.057	3.133*
Vertical displacement of the basin right	0.944	0.275	1.372	0.011	2.385*
Horizontal displacement of the left knee	4.252	0.059	4.606	0.018	3.361*
Accidental displacement of the left knee	-1.7	0.471	-1.492	0.968	0.835
Vertical displacement of the left knee	1.22	0.074	1.583	0.021	2.725*
Horizontal displacement of the right knee	0.539	0.139	1.017	0.175	2.758*
Accidental displacement of the right knee	-0.811	2.741	0.895	2.481	2.557*
Vertical displacement of the right knee	1.741	0.197	2.559	0.284	2.598*
Horizontal displacement of the left foot	8.62	0.576	9.45	0.028	3.598*
Accidental displacement of the left foot	-0.366	0.585	-0.576	2.379	0.409
Vertical displacement of the left foot	0.985	0.367	0.441	0.033	2.756*
Horizontal displacement of the right foot	-1.392	0.523	-1.512	0.119	0.569
Accidental displacement of the right foot	-0.777	0.452	-1.455	0.612	1.977
Vertical displacement of the right foot	0.838	0.80	2.072	0.361	2.883*
Horizontal displacement of the blade	1.923	0.737	2.361	0.471	1.28
Accidental displacement of the blade	0.417	0.001	2.031	1.478	3.752*
Vertical displacement of the blade	0.804	0.106	0.832	0.337	0.109

The value of T indexed at 0.05 and degrees of freedom 7 = 2.3646

contribution of the left point of the basin, the basin contributes to slide the right preparation for the occasional snap of the man moved back ahead and helping to save the balance of the body and then the stability of the direction of the blade to the opponent goal and this is consistent with the findings of Corina [3] that in the beginning of the attack plane directs the body's center of gravity by lowering and subsequent shift in the direction of the target, where the movement begins actively muscles of the hind leg as a result of the transfer of the center of gravity and the removal of the front knee in preparation for the moment of propulsion and flight, as shown in Table 1 sign of the differences between tribal and dimensional measurements in variable vertical displacement of the left knee and displacement horizontal left foot where the researcher finds the relevance of these variables with each other to achieve the requirements of the technical performance of the skill. When the body is moved to the front man curse cause loss of balance are raising the back of the foot on the ground and thus to the vertical displacement of the left knee and move strongly forward and thus to the horizontal displacement of the left foot. We have clarified the differences between the measurements due to increased body lean forward and delayed left foot front land for a moment the beginning of aviation has led to overcome the man back of the man the

front vantage in a shift in the direction of the target before the moment of the beginning of aviation thereby acting to stabilize the body during flight in the direction of the target, that was an impact on increasing the values of displacement horizontal feet left and vertical left knee during the moment of the beginning of aviation.

Seen from the Table 2 the existence of statistically significant differences between tribal and dimensional measurements of sample variables in the horizontal velocity of the basin left, vertical speed of the basin the left, the horizontal speed of the basin right, speed spin-off of the basin right, vertical velocity of the basin right, the horizontal speed of the left knee, vertical velocity of the left knee, the horizontal speed of the right knee, speed spin-off of the right knee, vertical velocity of the right knee, the horizontal speed of the foot left, vertical velocity of the foot left, vertical velocity of the foot right, speed spin-off of the blade and the moment of the beginning of aviation. These differences were in favor of dimensional measurement where the value of (T) was greater than the calculated value (T) indexed at level of significance 0.05, as evidenced by the presence of non-statistical significant differences between the measurements in the remaining variables. The results of the table pointed to the increasing speed of horizontal and vertical points pelvis left and right in the direction the positive during the

moment of the beginning of aviation and that, as required by this moment of rapid doubling of the attacker to complete attack especially as the distance moves to striker be large requires the acceleration of high muscle group working for the man the front to start phase of the flight with the utmost force and thus the increase horizontal speed of the two pelvic left and right is the natural increase due to increased momentum. The researcher attributed these differences to the training program proposed, which uses the researcher exercises to develop strength quickly to make the working muscles stronger when the average speed Training, which is then and also the training of the muscles as fast as similar to the speed of movement during the competition. This is confirmed by Elaine [4] focusing on training the feet of various distances and especially the large distances through the odd and even lessons.

The table indicates that there are significant differences between the measurements tribal and post in the variables of the horizontal speed and vertical left knee a moment of beginning of the flight. This is because the researcher to the technical performance of the attack in the beginning, which occurs during which the speed of the transfer of the center of gravity on the man front leads to an imbalance in preparation to move man's background, this fast performance sudden must be accompanied by contractions of fast muscles of the two men, as to contract the muscles of the man front to carry the body from falling, a prelude to the stage of payment, is through the high foot rear on the ground and moved strongly to the forefoot and that have been taken into account by the researcher through the development of the training program using exercises ballistic muscles of the two men to develop force rapidly, leading to increased strength fast, which helped to power and speed of payment of the body forward and the power and speed the transfer of man's background.

These results are consistent with prior studies [5, 6] which reached that the training ballistic increases the power and speed as it has a significant influence on the adjustment speed of the nervous system and muscle with the nature of performance, the opposite of training ballasting loads and high speeds slow, which in turn is frustrating for the adaptation of the neuromuscular system commensurate with the speed and power performance required.

The table refers to the existence of statistical significant differences between the measurements and tribal dimensional variables in the horizontal and vertical speed of the foot left the moment of beginning of the

flight, as the shift surprise in the face of goal for the moment of the beginning of aviation, which is done by moving the center of gravity on the man front and a state of loss of balance, it is natural to be followed by a transfer of a rear forward but very quickly. Any displacement of a horizontal and vertical fast, which redressed the researcher during the attitude of the training program was used as ballistic training and training of each individual compound in the training of the muscles of the lower end of the rapid development of force necessary for the performance. This is in line with previous works [7-10] that the training complex including containing the resistance training and weight training together in the same unit training works to increase the strength of the fast muscles trained.

The table indicates that there are significant differences between the measurements tribal and post in a variable-speed vertical foot right moment of the beginning of aviation and it reflects the transfer speed center of gravity on the man front and the speed of the shift in the direction of the target.

The table refers to the existence of statistical significant differences between tribal and dimensional measurements in a variable-speed spin-off for the moment we start flying, during the moment of beginning of the flight occurs cut to the center of gravity followed by a shift in the direction of the target as it happens offsets horizontal and vertical and transverse to the blade, P vertical and horizontal displacement occurs during the individual farmers and armed flight to reach the goal and the displacement cross talk to offset the sudden transformation in the face of the target and adjust the direction of the blade in the direction of the target to register a touch with the utmost precision, Therefore increased the average speed of the spin-off for the moment we reach the beginning of aviation and this is what restores the researcher to the proposed training program.

It is seen from Table 3 the existence of statistical significant differences between the measurements tribal and post the sample during the moment of the beginning of aviation in the variables of the angular velocity of the basin right, change angular left knee, the angular velocity of the left knee, the angular velocity of the wrist right foot, as evidenced by the existence of differences is statistically significant between the two measures in the remaining variables, where the table refers to the increase in the average values of the angular velocity of the basin right in the telemetric for tribal measurement of research sample, with a difference is statistically significant for

Table 3: Significant differences between tribal and dimensional measurements of the angles and speeds the angle of the biomechanical indicators selected during the moment of the beginning of aviation (n1 = n2 = 8)

Biomechanical variables	Pre-measurement		Post-measurement		Value (T)
	Mean	Deviation	Mean	Deviation	
Left corner of the basin	85.915	17.569	86.739	59.623	0.256
Angular velocity of the basin left	-77.269	95.007	-84.753	169.29	0.099
Right corner of the basin	158.563	12.711	164.476	6.728	1.162
Speed right corner of the basin	2.008	0.262	2.957	0.604	2.723*
Angle of the left knee	69.275	12.009	83.907	5.196	3.338*
Angular velocity of the left knee	403.603	42.349	593.295	141.411	3.149*
Angle of the right knee	172.677	1.799	173.12	2.13	0.447
Angular velocity of the right knee	170.307	256.42	170.28	93.256	0.056
Angle of the left ankle	99.893	15.057	102.104	17.115	0.24
Angular velocity of the left ankle	34.582	420.631	24.699	138.55	0.073
Angle of the right ankle	135.07	5.331	139.068	10.784	0.818
Angular velocity of the right ankle	561.085	187.77	235.097	323.887	2.947*

The value of T indexed at 0.05 and degrees of freedom 7 = 2.3646

the angular change of the basin between the right and dimensional measurements tribal. This is due to the impact of exercise training program on the development of the work force quickly to the working muscle group, has led to increased speed and strength of muscle contraction that appeared in the increase in the average values of the angular velocity of the basin right.

The table refers to the increase in the average values change angular speed and the angle of the left knee during the moment of the beginning of aviation Increasing the speed of the transfer of the center of gravity on the man front in preparation for the phase of the flight led to the rapid movement of hind leg compared relative tribal was going on was delayed relative to the transfer of the man the background.

The table refers to the increase in the average values of the angular velocity of the wrist right foot during the moment of the beginning of aviation, with a difference is statistically significant to change the angular wrist right foot between the measurements tribal and post, due to rapidly reduce the center of gravity and the speed of the shift in the direction of the goal led to the transfer of the center of gravity the man on the front at a faster rate occurred with the effect that initiates accelerated phase of the flight Addition to the power and speed to the working muscles gained from the program, especially muscle twin, who has had a significant impact in increasing the power and speed of payment.

Results for the Moment the Start of the Touch: It is seen from Table 4 the existence of statistical significant differences between the measurements tribal and post the sample in the variables displacement horizontal of the basin left, displacement horizontal of the basin right,

displacement horizontal left knee, displacement horizontal right knee, displacement horizontal foot left, displacement horizontal foot right foot, accidental displacement of the blade, the vertical displacement of the blade, as evidenced by the presence of non-statistical significant differences between the measurements in the remaining variables, where the table shows the sign of the differences between the measurements and tribal dimensional variables in the horizontal displacement of the basin left, horizontal displacement of the basin for the right moment of start of touch. The researcher believes it is a natural result of the impact of the training program proposed the momentum and speed in the shortest time possible due to the containment of the training program on a set of exercises specific to power development deals as soon as the muscle group involved, which had a great impact on the increasing momentum of the muscles of the legs and had a positive impact on the increase the horizontal displacement of the basin the right and left.

The table shows the sign of the differences between the measurements tribal and post in the variables of displacement horizontal left knee, displacement horizontal foot left the moment of the beginning of the touch, due to the technical performance of the attack, which must be through registration of touch at the same moment of setting foot back on the ground, Which is determined by the horizontal displacement of the left foot, through which we can determine the distance required to travel to reach the goal of the blade to rival the required accuracy, the larger the offset horizontal feet left short as led to the change in body position and the blade to compensate for the difference in distance traveled and then not achieved the desired resolution in of performance.

Table 4: Significant differences between tribal and dimensional measurements of the horizontal and vertical offsets of the biomechanical indicators selected during the moment of beginning of the touch (n1 = n2 = 8)

Biomechanical variables	Pre-measurement		Post-measurement		Value (T)
	Mean	Deviation	Mean	Deviation	
Horizontal displacement of the basin left	1.658	0.005	1.751	0.004	3.40*
Accidental displacement of the basin left	0.550	0.001	0.572	0.001	1.187
Vertical displacement of the basin left	0.868	0.001	0.869	0.002	0.107
Horizontal displacement of the basin right	1.613	0.003	1.769	0.006	4.572*
Accidental displacement of the basin right	0.272	0.021	0.339	0.014	0.882
Vertical displacement of the basin right	0.854	0.001	0.861	0.001	0.94
Horizontal displacement of the left knee	1.998	0.004	2.093	0.004	3.65*
Accidental displacement of the left knee	0.509	0.001	0.516	0.001	0.423
Vertical displacement of the left knee	0.496	0.001	0.507	0.001	0.612
Horizontal displacement of the right knee	1.258	0.004	1.34	0.004	3.016*
Accidental displacement of the right knee	0.417	0.005	0.424	0.006	0.171
Vertical displacement of the right knee	0.557	0.001	0.564	0.001	0.619
Horizontal displacement of the left foot	2.334	0.008	2.448	0.005	3.472*
Accidental displacement of the left foot	0.492	0.001	0.507	0.001	0.791
Vertical displacement of the left foot	0.146	0.003	0.15	0.001	0.231
Horizontal displacement of the right foot	0.653	0.001	0.756	0.004	3.746*
Accidental displacement of the right foot	0.607	0.011	0.571	0.002	0.711
Vertical displacement of the right foot	0.523	0.008	0.539	0.015	0.401
Horizontal displacement of the blade	3.481	0.001	3.492	0.001	1.49
Accidental displacement of the blade	0.594	0.006	0.755	0.001	6.521*
Vertical displacement of the blade	1.511	0.001	1.318	0.001	9.345*

The value of T indexed at 0.05 and degrees of freedom 7 = 2.3646

The table shows the sign of the differences between tribal and dimensional measurements in the variables of the horizontal displacement of the right knee, horizontal displacement of the right foot touch the very beginning, due to the proposed training program, which helped to increase the momentum and thus runs the horizontal offsets right leg.

The table shows the sign of the differences between the measurements tribal and post in the variables of displacement spin-off of the blade, displacement vertical to reach the moment of the start of touch, because there was an exaggeration to move the vertical blade arrange for rush phase of the flight before turning in the direction of the target increased its angle of flight has led to increased displacement of vertical measurement tribal, This was remedied in the training program helped to the stage of flight delays and increase the tendency of the front of the body so air in the horizontal direction in the direction of the target.

It is seen from Table 5 the existence of statistical significant differences between the measurements tribal and post the sample in the variables horizontal velocity of the basin left, the horizontal speed of the basin right, the horizontal speed of the left knee, vertical velocity of the left knee, the horizontal speed of the right knee, vertical

velocity of the right knee, horizontal speed of the foot left, vertical velocity of the foot left, the horizontal speed of the foot right, vertical velocity of the foot right, the horizontal speed of the blade, vertical velocity of the blade, for the moment the start of the touch, as evidenced by the existence of statistical differences between the two measures in the remaining variables, where the results indicated the table to the increasing speed of horizontal and vertical points pelvis left and right in the direction the offer or during the moment of the beginning touch. This is because the moment is the final product to complete the attack, increasing the speed of these two points, a natural consequence stemming from the increased momentum of the muscle group working for the man of the front during the beginning of the flight, due to the training program, which uses voltage resistance to further stimulate the nervous system to exert effort.

This is in line with the Donald [11] that the effort of resistance leads to stimulate the nervous system to exert maximum effort in turn could lead to the participation or the provision of tissue muscle from type Iib to perform the exercise, the maximum possible energy and then take advantage of the exercise, the best they could, where the pattern Iib of muscle tissue which can not be provided

Table 5: Significant differences between tribal and dimensional measurements of the horizontal and vertical speeds of biomechanical indicators selected through a moment of beginning of the touch (n1 = n2 = 8)

Biomechanical variables	Pre-measurement		Post-measurement		Value (T)
	Mean	Deviation	Mean	Deviation	
Horizontal speed of the basin left	2.46	0.478	3.423	0.551	2.994*
Speed spin-off of the basin left	-0.346	1.952	-0.927	1.852	1.09
Vertical velocity of the basin left	-1.212	0.253	-1.227	0.434	0.062
Horizontal speed of the basin right	1.685	0.353	2.493	0.788	2.41*
Speed spin-off of the basin right	1.343	0.239	2.17	0.387	3.315*
Vertical velocity of the basin right	-0.718	0.35	-0.822	0.359	0.323
Horizontal speed of the left knee	2.227	0.019	2.835	0.176	4.629*
Speed spin-off of the left knee	0.395	0.109	0.77	0.543	1.167
Vertical velocity of the left knee	-1.128	0.505	-1.572	0.209	3.11*
Horizontal speed of the right knee	2.43	0.68	3.355	0.14	2.639*
Speed spin-off of the right knee	-0.397	5.366	-0.737	3.283	0.455
Vertical velocity of the right knee	-0.454	0.15	-0.881	0.224	3.206*
Horizontal speed of the left foot	2.037	0.264	2.51	0.207	2.48*
Speed spin-off of the left foot	0.701	0.111	0.902	0.178	0.971
Vertical velocity of the left foot	-2.382	0.181	-4.474	-0.298	8.827*
Horizontal speed of the foot Yemeni	2.203	1.541	3.252	0.886	3.136*
Speed spin-off of the right foot	0.461	0.303	0.775	0.245	0.93
Vertical velocity of the right foot	2.721	0.118	3.478	0.318	2.777*
Horizontal speed of the blade	0.461	0.008	0.587	0.002	3.308*
Spin-off speed of the blade	0.193	0.022	0.404	0.727	0.729
Vertical speed of the blade	0.442	0.008	0.718	0.035	3.727*

The value of T indexed at 0.05 and degrees of freedom 7 = 2.3646

once the exercise of any form of traditional exercise. Trainer must therefore focus on the trainee during the performance as well as doing the exercise maximum potential.

The results indicated the increasing speeds of horizontal and vertical moment of the beginning of the touch of the left knee, left foot, As it contains training program on the training vehicle to increase the rate of vertical and horizontal jump, This is consistent with the study of Adams [12] for the performance of 48 athletes trained using the training compound, leading to a higher rate of horizontal and vertical jump rate of 10.76 cm for trained traditional exercises where the achieved rate of increase of 3.30 cm.

The results indicated an increase in the horizontal and vertical velocities during the moment of the beginning of the touch of the right knee, right foot and that a natural product to increase the momentum of the front leg muscles during the moment of flight.

Table 6 shows the existence of statistical significant differences between the measurements tribal and post the sample in a variable change angular left knee and that the moment of the beginning of the touch. As evidenced by the presence of non-statistically significant differences between the two measures in the rest of variables,

registration of a touch on the goal of competing at that time, the faithful foot touches the ground and background in the far arm across her. Through the training program and it contains exercises to increase strength and speed of payment occurred an increase in the displacements and velocities of all points of the body especially the displacement of horizontal foot left as indicated in Table 1, fueling an increase change angular left knee a moment of contact with the hind leg of the Earth.

Seen from the Table 7 the existence of statistically significant differences between the measurements tribal and post the sample in the variable accuracy of performance, these differences in favor of telemetric, where it came from the value (T) calculated 2.966 which is the largest of the value of (T) spreadsheet, which amount to 2.364 When the degree of freedom (7). This is because the researcher that the proposed training program, which has had a positive effect appeared clearly in the differences between the measurements of tribal and dimensional indicators biomechanical, which outlined the statistical differences (Tables 1-6) resulting in differences in the Table 7.

This is confirmed by Elliot [13], Adrian and Cooper [14] and Barrow [15] that the assessment of motor performance on the dimension of mechanical renowned

Table 6: Significant differences between tribal and dimensional measurements of the angles and speeds the angle of the biomechanical indicators selected during the moment of beginning of the touch (n1 = n2 = 8)

Biomechanical variables	Pre-measurement		Post-measurement		Value (T)
	mean	Deviation	mean	Deviation	
Left corner of the basin	93.064	3.684	94.258	7.653	0.408
Angular velocity of the basin left	81.025	284.48	127.854	187.134	0.415
Right corner of the basin	147.728	4.639	154.272	13.733	1.523
Speed right corner of the basin	20.408	238.59	30.852	333.96	0.085
Angle of the left knee	149.657	4.386	156.154	2.708	3.371*
Angular velocity of the left knee	8.693	66.036	20.493	81.45	0.291
Angle of the right knee	120.94	18.969	130.851	16.936	0.897
Angular velocity of the right knee	-211.29	251.05	-294.62	544.48	0.444
Angle of the left ankle	102.37	3.926	107.89	17.356	0.788
Angular velocity of the left ankle	362.616	361.54	720.926	439.89	1.957
Angle of the right ankle	146.99	6.479	149.871	5.471	0.918
Angular velocity of the right ankle	-92.924	282.88	212.366	227.95	1.001

The value of T indexed at 0.05 and degrees of freedom 7 = 2.3646

Table 7: Significant differences between the measurements of tribal and dimensional accuracy in the performance

Biomechanical variables	Pre-measurement		Post-measurement		Value (T)
	Mean	Deviation	Mean	Deviation	
Accuracy	62.5	12.817	80.00	15.118	2.966*

The value of T indexed at 0.05 and degrees of freedom 7 = 2.3646

for objectivity in the evaluation, as well as study the mechanical properties contribute to improve the technique by corrective and developed according to the theories of training.

CONCLUSION

- C The proposed training program had a positive impact in terms of moral biomechanical indicators of attack aircraft.
- C The presence of ballistic exercises and compound exercises within the program helped to develop force rapidly and consequently led to increase the speed and momentum.
- C When training attack aircraft must use the training to make the composite stronger muscles working at the rate of speed, which is training her.
- C Improve the ability of the muscles working muscle in the legs helps to increase the momentum during the beginning of aviation.

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