

A Training Programme for Developing Motor Response and Balance and its Effect on Lunging Accuracy of Fencing Juniors

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Abstract: This research aims at designing a training programme for developing motor response and balance and identifying its effect on the lunging accuracy of fencers. The researcher used the quasi-experimental approach with the experimental design of one group (pre and post- measurement). Research sample (7 fencers) was chosen in the purposefully from fencing juniors (13-15 years old) from Al-Shuban Al-Moslemeen Sports Club in Tanta for the (2009-2010 season). Then, the researcher performed review of literature in order to specify the tests related to the physical abilities under investigation and the following four tests could be achieved : motor response test and its (measured by sec), motor balance test (measured by cm), static balance test (measured by sec), lunging accuracy test (measured by sec). The periodical training method was followed in the proposed training programme and the training programme was divided into three months from 8th May to 30th July, 2010 and the training load was calibrated so that the training intensity should not exceed 80% and its size three (3) weekly training units. Performance time was stated as (10-30 sec) of each exercise with (6-12) repetitions and rest intervals of (120-240 seconds) taking into consideration that pulse rate would not decline to less than (110 -120 pulse /minute). Warm-up and cool down were excluded from the training unit's total time of 15 min. which led to an improvement of motor response and balance of its different kinds that ranged from 12.10% to 60.96% and lunging accuracy was improved by 40.86%.

Key words: Motor response • Balance • Lunging accuracy

INTRODUCTION

A player's acquisition of the physical qualities related to the kind of activity being practised represents a great importance in preparing the player for meeting the requirements of the activity being practised in the best form and it also helps the players to achieve the motor duties required from them and it depends on the extent to which they have these physical qualities [1].

Accuracy is considered one of the important elements when performing many of the different sports skills and it reflects the individual's ability to control his/her voluntary movements and skills that require accuracy of performance. This does not usually require great strength or violent movements. Instead, they need a great ability of concentration and a high degree of neuromuscular co-ordination; in addition to relying on having a good sense of speed, distance and right timing evaluation [2, 3].

The researcher also noticed that accuracy is measured according to the sport's nature. In fencing, for

example, it is achieved by directing the weapon's tip to the opponent's target in order to score a touch. Motor accuracy calls for a high degree of efficiency regarding the work of muscular and neural systems in addition to controlling the working muscles directed towards the opponent. Accuracy and motor response are connected with the auditory and visual awareness, quick thinking and right expectation of changing situation, as well as technical level, choosing the suitable response and motor speed of the armed hand.

The increasing requirements of accuracy results in a reduction in speed level and vice-versa. Thus, the age range starting from 11 till 14-15 years old is considered the most suitable for developing the movements and ensuring their accuracy as the coach has to aim for accuracy of performing the skills during this period, as when we take the changes that take place in the young players' bodies during the sexual maturity period into consideration, we can notice the reduction of speed level and accuracy which results in a decline of the technical level [4].

The researcher sees that the physical requirements related to the kind of activity being practised should be developed through training methods suitable for that particular activity since developing the motor response and balance are considered the most important methods of developing accuracy which was confirmed by previous studies indicating that balance is one of the basic physical qualities of the player's performance of any sports movement and if the player is to lose his ability of balance, he consequently loses his accuracy of performing the skill. Balance is divided into two kinds: Static balance and Dynamic balance [5,6]. In addition, previous studies stated that motor response is one of the important physical abilities of a fencer and that motor response depends on movement accuracy, spatial and chronological orientation and accuracy of visual, auditory and sensory perception [7].

Through the researcher's work in the field of training and through her observation of many local championships, she found a great difference between times of scoring touches and times of lunging especially in the junior matches under 15 years and the researcher attributed this to being the result of the decline of motor response level and balance which in turn affects lunging accuracy, since lunging accuracy is one of the most important skills of fencing. After reviewing the results of the relevant studies [8-10] the researcher was urged to perform the current research.

Research Objective: This research aims at designing a training programme for developing motor response and balance in order to identify its effect on lunging accuracy of fencers.

Research Hypothesis: There are statistically significant differences between the pre- and post- measurements in relation to the level of motor response, balance and lunging accuracy level of fencing juniors in favour of the post- measurement.

MATERIALS AND METHODS

Approach: The researcher used the quasi-experimental approach with one group (pre- and post- measurement).

Research Sample: The research sample was chosen purposefully from the fencing juniors (13-15 years) from Al-Shuban Al-Moslemeen Sports Club in Tanta (2009 - 2010 season) and it included seven juniors

In Table 1, the researcher characterised a sample in relation to growth and physical variables under investigation and skewness was in the ± 3 which gives a direct significance of the data being free from the shortcomings of abnormal distributions.

Research Tools: Tools and apparatus used in the research were a restameter for measuring height in centimetres -electronic medical scales for measuring weight in kilograms -a stopwatch.

Research Tests: The researcher reviewed the related literature in order to specify the tests related to the physical abilities under research and the following four tests were achieved: test of motor response and its measurement unit (sec) [8], test of dynamic balance and its measurement unit (cm) [9], test of static balance and its measurement unit (sec) [10], test of lunging accuracy and its measurement unit (sec) [11].

Table 1: Research Sample characterization of the (height-weight-age-training age) variables and physical and technical variables (N=7)

Serial	Variables	Measurement Unit	Mean	Median	Standard Deviation	Squewness	
Basic Variables							
1	Age	Year	13.67	13.60	0.45	0.43	
2	Height	Cm	161.28	160.00	4.46	0.22	
3	Weight	kg	53.71	53.00	5.21	0.13	
4	Training Age	Year	5.28	5.00	0.48	1.23	
Physical Technical Variables							
1	Test of Motor Response	To the right To the left	Sec Sec	1.76 1.57	1.67 1.53	0.26 0.13	0.69 0.77
2	Test of Lunge Accuracy		Sec	0.93	0.92	0.45	0.14
3	Test of Static Balance		Sec	16.42	17.10	3.75	-0.41
4	Test of Dynamic Balance	To the right To the left	Cm Cm	34.42 21.57	35.00 0.0	36.27 28.20	-0.37 0.72

The Training Programme: The training programme aims at developing motor response and balance in order to identify its effect on lunging accuracy of fencers. The periodical training method was followed and training programme was divided into three months during the period from 8th May, 2010 to 30th July, 2010 and training load was legalised so that training intensity should be more than 80%, its size is three weekly training units and performance time was 10-30 sec of each exercise with 6-12 repetitions (120-240 sec), taking into consideration that pulse rate is not to be reduced less than 110-120 pulses /min. Also, Warm-up and finishing times were excluded from the training unit's total time of 15 min.

Research Measurements: The researcher performed the pre- and post- measurements following the same procedures and steps that conform with the scientific conditions related to performing the measurement of each test.

Statistical Processes: Mean, median, standard deviation, skewness, (T) Test of differences, percentage of improvement.

RESULTS AND DISCUSSION

Through performing pre-and post- measurements on the experimental group under research, data were collected and statistically processed in the following table

Table 2 shows that the mean pre-measurement was trapped in the 1.57 range as the smallest value of motor response test to the right and 34.4 as the biggest value of the dynamic balance test to the right. Post-measurement mean was trapped in the range of 1.40 as the smallest value of the dynamic balance test to the left,

and 20.7 as the biggest value the dynamic balance test to the right. From (t) tabulated value of 1.94 at an abstract level of 0.05 that it is less than the calculated (t) value which was trapped in motor response variables and balance tests between 4.37 and 9.50 which indicates that the means of differences between the pre-measurement and post-measurement were in favor of post-measurement and the mean of improvement percentages ranged between 12.10 % : 60.96 %.

Also, from Table 2 results, it can be shown that pre-measurement mean of lunging accuracy variable was in the pre-measurement 0.93 whereas it became 0.55 in the post-measurement. From (t) tabulated value of 1.94 at an abstract level of 0.05 that it is less than the calculated (t) value in the lunging accuracy test of 4.22 with a percentage of improvement of 40.86%. Also, from Table 2, it can be seen that the tabulated (t) test value is 1.94 at an abstract value of 0.05 less than the calculated (t) value of 4.22 in relation to the lunging accuracy variable and the percentage of improvement between pre-measurement and post-measurement is 40.86% which indicates that there was an improvement of post-measurement in comparison to pre-measurement.

Table 3 shows the correlation coefficient between the physical variables (test of motor response, test of static balance, test of dynamic balance) and the technical variable under research (lunge accuracy) at a significant level of 0.05.

From Table 3, correlation between accuracy and motor response at a value of 0.73 is shown and also correlation between accuracy and static balance at a value of -0.76, and correlation between accuracy and dynamic balance at a value of 0.82 which reflects the effect of motor response, static and dynamic balance on lunge accuracy of the research sample.

Table 2: Difference Significance between the means of (pre-post) measurements and percentages of improvement of the research group in the motor skills' variable (N= 7)

Serial	Tests of Motor Skills	Pre-measurement		Post-measurement		Standard Deviation of the Median	"T" Value	Percentage Of Improvement%	
		A.M	±SD	A.M	±SD				
1	Test of Motor Response	To the right	1.76	0.26	1.40	0.18	0.06	6.00	20.45
		To the left	1.57	0.13	1.38	0.11	0.02	9.50	12.10
2	Test of Lunge Accuracy	0.93	0.45	0.55	0.21	0.09	4.22	40.86	
3	Test of Static Balance	16.42	3.75	20.14	4.53	0.85	4.37	22.66	
4	Test of Dynamic Balance	To the right	34.42	16.27	20.71	11.76	2.06	6.65	39.83
		To the left	21.57	18.20	8.42	11.22	2.49	5.28	60.96

*Abstract value at 0.05 level=1.94

Table 3: Correlation coefficient between the physical variables and technical variable under research (Lunge Accuracy)

Physical variables technical variable	Test of Motor Response	Test of Static Balance	Test of Dynamic Balance
Lunge Accuracy	0.73	-0.76	0.82*

Tabulated (R) value at a significant level of 0.05 =0.66

DISCUSSION

Through discussion of the aforementioned results, effect of the proposed training program on the post-measurement results is clearly reflected as it was shown that there are statistically significant differences between pre-measurement and post-measurement of the experimental group under research and that these differences are due to the positive effect the training program had on post-measurement results in comparison to pre-measurement of the same sample. Also, in the light of the results' analysis, the researcher sees that the simple motor response speed has a positive effect on the performance level of achieving target accuracy of fencers and that accuracy level is improved by using dynamic and static training tools since most forms of performance in competition depend on the player's reaction on his opponent and they confirm that lunging accuracy is based on the element of balance as we find performance in matches to be varied; sometimes a player needs static balance and may need dynamic balance at other times. Therefore, balance is so important for achieving accuracy of lunging especially if it is characterized with speed as lunging movements are performed from safe distances away from the opponent and these results conform with previous studies indicating that developing the lunging accuracy requires certain elements as motor response and balance since fencing sport has specific requirements [2-7].

In addition, technical variable improvement resulted from the proposed training program which conforms to previous studies that confirmed the importance of physical variables and their effect on lunging accuracy level [8-11].

From the results, positive effect of the training program is shown and the researcher attributes this to the fact that physical abilities (motor response, balance (static and dynamic) are of the basic qualities that play a great role in transferring the body weight and motor streaming of a fencer.

Recommendations: In the light of the achieved research results, the researcher recommends the following:

- Using the proposed training program has a positive effect on lunging accuracy level.
- It is necessary to perform similar training programs for all age stages.

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