Effect of Developing Self-Sensory Receptors on Some Physical and Skill Variables of Handball Beginners

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Abstract: This study aims to design a training program to develop self-sensory receptors and to recognize its effect on dynamic balance, eyes, arms and ball match, eye-legs match, passing from running and aiming by flying, of Army Club players. Research sample reached 36 players, basic sample number is 24. The two researchers used the experimental method, the most important results are represented in the positive progress of physical changes studied in the research and the improvement of skill variables in passing from running and aiming by flying as it reached more than 14% of skill changing studied in the research. The two researchers recommend paying more attention to develop self-sensory receptors of Handball players in different age stages in addition to make a study like this to develop self-sensory receptors of defense and goalkeeper skills.

Key words: Handball %Self-sensory Receptors

INTRODUCTION

Different body self-sensory receptors play an important role in player’s performance of all kinds of Handball movement skills. The efficiency of movement skills technical performance depends on the efficiency of self-sensory receptors as they transmit Sensory nerve signals to Cerebral cortex, where they are analyzed then information are formed. The two skills of passing from running and aiming by flying are of the most attack skills used in matches.

The two researchers through training and following up the players of the studied research, they noticed that there is a remarkable drop in the skill performance of passing from running and aiming by flying despite its importance in Handball game, they returned that to the dispersion of working and receiving muscle in preserving body balance during performing movement skill, which results in the loss of muscle power directed to correct performance. For that, this study seeks to develop self-sensory receptors of Handball players through activating the role of self-sensory receptors by improving both the neuromuscular match to increase muscular power directed to performance. Scientific references referred that balance entity is preserved by neuromuscular match with transmitting a stream of pulses that pass through feeling, then nerves then the bone marrow to brain then bone marrow to nerves to muscles.

This research aims to design a training program to develop self-sensory receptors and to recognize:

C The effect of the suggested training program on some physical changes (dynamic balance, eye, arms and ball match, eye-leg match, throwing a ball from maximum distance jump, bending the trunk towards forward from standing, legs muscular power, right grip power, left grip power, back muscles and legs muscular ability).

C The effect of a suggested training program on some skill changes (passing from running and aiming by flying).

MATERIALS AND METHODS

The two researchers used the experimental method by experimental design (before-after) on one group. Research society was chosen deliberately from Handball players of Army Club. Research sample was chosen deliberately from Handball beginners born in 1996 of Army Club.
Research Sample Homogeny: The skewness and kurtosis by the significance of the mean, the median and the standard deviation of basic research sample in changes of age, height, weight, training age, body mass and physical and skill variables were calculated and were less than ±3, which signifies its homogeneity in these variables.

Tools and Means of Data Gathering
The Used Tests
Physical Tests:
- Dynamic balance test.
- Eye, arm and ball match test.
- Eye-leg match test.
- Throwing a ball from jumping to maximum distance test.
- Spinal cord flexibility test (bending trunk forwardly from standing position).
- Legs muscular ability test.
- Right grip power test.
- Left grip power test.
- Back muscles power test (test of stable power of back muscles).
- Legs muscles power test (test of stable power of legs muscles).

Skill Tests:
- Passing from running test.
- Aiming by flying test.

Tools and Equipments of Measurement Used in the Research:
- A restmeter to measure height by cm.
- A medical scale to measure body mass to 1/10kg.
- A stopwatch.
- Measurement tape.
- A manometer to measure grip power.
- Free and different weights.
- Boxes of different heights.
- Medical balls.
- Ropes.

Scientific Interactions
Honesty of Tests: The two researchers used comparison honesty of the lowest and highest spring parties to find the difference of research sample (12) players. Results indicated that there are significant differences statistically shown at the morale level (0.05) between the lowest and highest spring in the physical tests studied in the research, which proves that the test are of high degree of honesty and have the ability to show differences, consequently, they can measure what they were designed to measure and are valid to be used.

Persistence of Tests: To find test reliability coefficient, the two researchers applied tests then re-applied them after 7 days of the first application in order to find correlation coefficient between first and second applications. Results indicated that there are no significant differences show statistically between the first and the second application and that there is a correlation statistically shown at the morale level of (0.05) between first and second applications (test and re-test) which signify that these tests are of high degree of persistence and consequently can be used.

The Training Program
Program Design: The training program was designed to develop self-sensory receptors and to study its effect on physical and skill variables studied in the research through the following:

Program Content
General Training Program Included:
- General warming trainings to prepare different body muscles and to activate blood circulation.
- Trainings to develop body joints flexibility with stretching muscles (movement stretching).
- Training by weights to develop different body muscles and to improve physical elements studied in the research beside that the training by weights is considered an important establishment of muscle balance.

- The maximum power of each player was measured a period before establishment by weights in order to rate the used weights, to define the intensity and to make sure that the training program runs in a positive development rate and that the physical weight is suitable.
- Neuromuscular homogeny trainings.
- Muscular balance trainings.
- Movement stretching trainings.
Program Periods

The Period of Training by Using Weights: The two researchers analyzed the special needs of establishment by weights of research sample studied in the research to recognize:

- The working muscles.
- Special trainings of these muscles.
- Flexibility trainings of these muscles.

26 trainings were chosen and were put for training through the suggested program.

The Period of Muscle Balance Trainings: The two researchers analyzed the special needs of muscle balance trainings of research sample personnel through recognizing:

- The working muscles.
- Special trainings of these muscles.
- Flexibility trainings of these muscles.

39 trainings of muscle balance were chosen, they put to training through the suggested program.

The Period of Movement Stretching Trainings: The two researchers analyzed the special needs of the period of movement stretching trainings to research sample through recognizing:

- Special muscles to be taken care of during stretching trainings.
- Defining the stretching special trainings according to different places of the body.

64 trainings were chosen and put for training in the suggested program.

Training Units:

- The program was implemented at the rate of 5 weekly units of weights trainings from the first week to the second week (regarding the importance of muscular recovery), at the rate of 3 weekly units from the third to the tenth weeks (2 units in the playground and one at home).

Homework:

- Is represented in some home tasks by making neuromuscular match, muscular balance and movement stretching.

Program Time:

- Applying the training program takes (10) weeks in the period from 6/2/2011 to 22/4/2011.

Basic Study

Before Measurement: The two researchers applied the before measurements of research sample on age, height and weight variables and physical and skill changes, also the scientific interactions from 3/2/2011 to 25/2/2011.

Program Application:

- The start of applying the training program from 6/2/2011 to 22/4/2011.

After Measurement: After measurements were performed on research sample on the same conditions and specifications of before measurements after the end of program application period from 24/4/2011 to 26/4/2011.

Statistical Treatments

The Following Statistical Treatments Were Used:

- Mean
- Median
- Standard Deviation
- Skewness
- Kurtosis
- Independent Samples T Test
- Percentage of Progress

RESULTS AND DISCUSSION

First: Results of Physical and Skill Variables: Table 1 shows that there are significant differences statistically shown between before and after measurements of
Table 1: The mean, standard deviation, (T) calculated value and percentage of changes between before and after measurements of the experimental groups in physical changes, N=24

<table>
<thead>
<tr>
<th>Physical changes</th>
<th>Before measurement</th>
<th>After measurement</th>
<th>(T) calculated value</th>
<th>Change percentage</th>
<th>Significance (0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye, arm and ball match</td>
<td>11.000 ± 2.396</td>
<td>13.9.588 ± 1.756</td>
<td>2.958 ± 34.96</td>
<td>11.756 ± 26.89</td>
<td>Sig.</td>
</tr>
<tr>
<td>Eye-leg match</td>
<td>8.790 ± 0.951</td>
<td>7.5.86 ± 0.822</td>
<td>1.205 ± 8.15</td>
<td>9.911 ± 13.70</td>
<td>Sig.</td>
</tr>
<tr>
<td>Throw ball from max. distance</td>
<td>31.542 ± 5.183</td>
<td>38.292 ± 5.188</td>
<td>6.750 ± 50.50</td>
<td>22.317 ± 21.40</td>
<td>Sig.</td>
</tr>
<tr>
<td>Right grip power</td>
<td>30.333 ± 1.711</td>
<td>43.750 ± 2.382</td>
<td>13.417 ± 175.83</td>
<td>23.772 ± 44.23</td>
<td>Sig.</td>
</tr>
<tr>
<td>Left grip power</td>
<td>25.167 ± 1.633</td>
<td>37.208 ± 2.834</td>
<td>12.042 ± 184.96</td>
<td>20.803 ± 47.85</td>
<td>Sig.</td>
</tr>
<tr>
<td>Back muscles power</td>
<td>64.250 ± 5.870</td>
<td>86.125 ± 6.160</td>
<td>21.875 ± 1446.63</td>
<td>13.513 ± 34.05</td>
<td>Sig.</td>
</tr>
<tr>
<td>Legs muscles power</td>
<td>250.708 ± 14.834</td>
<td>313.375 ± 14.391</td>
<td>62.667 ± 858.33</td>
<td>15.890 ± 25.00</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

Table 2: The mean, standard deviation, calculated (T) value and change percentage between the before and after measurements of experimental group in skill changes, N= 24

<table>
<thead>
<tr>
<th>SKILL changes</th>
<th>Before measurement</th>
<th>After measurement</th>
<th>(T) calculated value</th>
<th>Change percentage</th>
<th>Significance (0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passing from running</td>
<td>12.089 ± 1.088</td>
<td>10.404 ± 1.227</td>
<td>1.685 ± 3.93</td>
<td>19.983 ± 13.94</td>
<td>Sig.</td>
</tr>
<tr>
<td>Aiming by flying</td>
<td>2.375 ± 0.824</td>
<td>3.750 ± 0.442</td>
<td>1.375- ± 11.63</td>
<td>9.475 ± 57.89</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

(T) table value at morale level (0.05) = Free degree 23

research sample in physical changes tests studied in the research in favor of after measurement as (T) calculated value was higher than (T) table value at the morale level (0.05).

The two researchers return the differences between before and after measurements and in favor of after measurement in physical changes studied in the research to weights trainings used in the suggested weights program, as the training was done with free weights to develop muscle power with its different kinds through a unified establishment program for 4 weeks aims to establish muscle power of all players in weak areas and to make stretching in places which have shortage as weight intensity during this period was (simple weight).

At this point the training program did not aim to develop muscle power of all body parties in general, while the training program was implemented during the next six weeks to match research sample studied in the research. For that, the training unit aimed to strengthen weak muscles to reach muscle power level and muscle stretching degree.

These results agree with the study of Ahmed Ibrahim Azab [1] and Kamel [2], as results showed that weights and movement stretching trainings led to the development of neuromuscular match, muscle power, movement range and muscle balance. These results also agree with the study of prior studies [3-5] as they pointed out that trainings of self-sensory receptors contribute in improving muscle power and balance.

Table 2 shows that there are significant differences statistically shown between before and after measurements of research sample in skill changes tests studied in the research in favor of after measurement as the calculated (T) value was higher than table (T) value at the morale level (0.05).

The two researchers return these differences and that progress in favor of after measurement to the suggested training program, in which they paid attention to self-sensory receptors development of Handball players as they increased the training weights gradually to match the nature of competition in Handball game. Consequently, to make the maximum use of self-sensory receptors development in improving muscle balance, neuromuscular match, muscular ability and power and flexibility which play an effective role in passing from running and aiming by flying skills.

Neuromuscular match is one of basic physical fitness components in Handball as no skill; offensive or defensive lacks this neuromuscular match. The skills of passing from running and aiming by flying depend on eye, arm and legs match and the player's ability to change his body position quickly and effectively, also his ability...
to connect between his speed and the speed of his colleagues to pass correctly and his ability to determine the aiming angle during flying then the balancing landing to keep playing.

Hassanin[6] points out that movement match of great importance to nervous system and that the match depends on health and accuracy of muscles and nerves functions and to be connected together in one work which requires the efficiency of nervous system in particular, from where nervous signal are sent to more than one body part in one time. This is what Ibrahim [7] confirmed, that passing from running requires that the player keeps his running speed timing during and after passing. And he adds that aiming by flying requires that the player tries to get rid of the hindering defense to achieve the goal then the correct landing after achieving the goal.

Legs and arms muscular ability is considered one of success indicators of Handball player and that he needs this muscular ability to move during running or to push land in order to fly and also the accuracy of passing and aiming. Milanovic [8] indicates that the muscular ability represented in vertical jumping from steadiness (explosive) represent the possibility of maximum muscular activity which enables human body to increase its speed in different athletic activities and that the bases of trainings are speed and explosive power which contribute in developing this ability.

These results agree with the study of previous researches [2-5] as they pointed out that self-sensory receptors development trainings contribute in improving balance, neuromuscular match, flexibility and muscular power and ability then skill performance.

CONCLUSION

Researchers Concluded the Following:

C There are significant differences statistically shown between before and after measurements of physical and skill changes studied in the research.

C Results showed the percentages of progress in all physical and skill changes studied in the research.

Recommendation: Depending on previous conclusions, the researchers recommend the following:

C The trainers should pay attention to neuromuscular match and balance trainings for their important effect in raising the skill level of players.

C To work to spread the concluded results in this study on Egyptian Clubs, through the Egyptian Union of Handball for the purpose of making use of them when training the beginners.

C To make more similar researches and studies on different age stages and in different sports in order to make use of these results in raising the standard of emerging talents in these sports.

C To make a similar study to develop self-sensory receptors development of defensive skills and goalkeeper skills.

REFERENCES


2. Kamel, I.M., 2007. The Effect of a training program to develop self-sensory receptors on some physical changes and aiming accuracy of basketball players. The Scientific magazine for Physical Education Sciences, Tanta University, 3: 15-44.


