TRAINING TO IMPROVE COMPLETION TIME AND ITS IMPACT ON SOME CHEMICAL INDICATORS OF THE HARDNESS OF SWIMMERS' BONES (200) METERS FREESTYLE

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ABSTRACT

The aim of the research is to identify the numerical values of the achievement of swimming (200) meters freestyle as an indicator of the exercises that they naturally receive, and the numerical values of the biochemical indicators of the hardness of the bones of swimmers at this distance, and to identify the relationship, impact, and contribution of these exercises to the biochemical indicators of the hardness of their bones, and the descriptive approach was adopted in the style of associative relations, on a sample of elite young swimmers for a distance of (200) meters freestyle who continued their training for the sports season (2020-2021) in the Police Sports Club, numbering (15 ) swimmer, chosen intentionally (100%), the researcher proceeded to conduct their tests to swim this distance, and then after completion, blood samples were drawn from them with an amount of (5cc) to measure the biochemical indicators related to bone hardness by conducting a laboratory examination, and then processing the data with the (SPSS) program to form the conclusions and applications that he performs violent exercises for swimmers a distance of (200) meters freestyle to reduce the level of biochemical indicators (calcium, magnesium, and inorganic phosphorous) related to bone hardness, and the time to complete a distance of (200) meters freestyle is contributes and affects the level of these biochemical indicators, it is necessary to ensure that players are not exposed to unnatural, harmful health conditions in order to measure the biochemical indicators (calcium, magnesium, and inorganic phosphorous) related to bone hardness, and to adopt a descriptive approach for this type of researches, and it is necessary to codify short-distance swimming training curricula within the anaerobic energy system in a manner that takes into account the health condition of the players’ bones, and enabling them to re-deposition the biochemical indicators related to bone hardness after high efforts in these exercises, which calls for emphasizing the ripples of the training load.

Key words: biochemical indicators, bone hardness, swimmer (200) meters freestyle.

I. RESEARCH PROBLEM AND IMPORTANCE:

“The importance of bones in the physiology of swimming sport and the movement of swimmers lies, in which through it move the limbs according to the theory of the lever or levers, a mild movement of a muscle connected to one of the limbs of the bone can lead to much greater movement at the other end of the bone, transfers muscle strength to the bone by tendons and helps training to strengthen and build muscles to prevent osteoporosis.” (lauralee,2004) Achievement sports and activities that aim to improve transitional speed depend primarily on muscular strength training, and the latter by its nature, does not develop unless it is subjected to the effort of the resistances that constitute a compressive effort at its point of impact, and according to the nature of the anatomical connection of muscles to bones, the bones thus cannot perform their physiological role in isolation from the muscles that meet the burden of resistance, as exercise affects the skeleton in several ways, as the direct effect of stress can increase bone mineral density, and here it will prevent fragility, while strenuous exercise affects the hormones that are related to bones in an opposite way. (Brown, Hebert, 2011) In line with the objectives of sports training physiology in free-swimming, knowledge policies must be supported for their trainers on health problems before they occur or swimmers are exposed to them, thereby re-establishing their view of redrawing planning. It is also the duty of coaches to note the sudden changes on Junior and young people who are involved in sports that require muscle strength, and they must quickly realize it as a kind of continuous evaluation for their planning for the future.
of these groups. (Kieling & Other, 2011), here's the issue at the center of the research related to two things: food and the environment, which need to be focused on ensuring bone strength and hardening and reducing their exposure to the possibility of bone thinning, the biological control of the chemistry of the body during the effort forces the swimmers to lose mineral elements, especially in violent efforts that they encounter in their training the physical effects on the bones, as "mineral salts help in maintaining the internal environment and in the formation of many tissues and show the need for them because they give strength and vitality and help It affects many vital functions during the motor work of the body. (Saife, 2010) "Sports food must contain calcium and magnesium salts, which are consumed when various metabolisms happen more severe when exercising." (Samiaa, 2010), where "calcium is one of the most present mineral elements in the body and contains the human body of about (1,200) g of calcium as there are (99%) From it in the skeleton, the human body needs about (500) mg of calcium every day." (Jockle, 2012) and "As it is known that calcium is very necessary in the process of muscle contraction, and strength in the muscles is likely to its presence or abundance in sufficient quantities in the muscles, and that the human body does not manufacture minerals as is the case by the synthesis of proteins, hormones and enzymes, but rather obtains them from eating the available food in these minerals. (Al-Ali, 2010) and "calcium is a very important element and suffice it to say that the construction of bones and teeth depends on it and the lack of the body from it causes osteoporosis, curvature, rickets, lack of muscle strength, contraction, neurological pain, etc., which affects young and old alike, and calcium is found in milk and part of leafy vegetables." (Keith, 2002) also "An important function of calcium is: calcium is important in skeletal construction, and it's an important factor in blood clotting, regulates permeability through cell walls, and it is essential for muscle contraction and relaxation, heart rate regulation, nervous reflexology, and maintenance of the acid-base balance in the body. (Jockle, 2012) As it is "Magnesium functions are similar to calcium functions and the body needs (300-350) milligrams per day and calcium performs some important functions such as the transfer of nerve signals and participates in muscular contraction by activating the enzyme (ATP ase) as it unites with phosphate to be the bones of the body and teeth as it participates in blood clotting and fluid transfer outside the cell and the body needs about (800) milligrams per day and the player does not need to take overdoses of it. Phosphorus, the chemical regulator of bones, is closely associated with potassium, potassium is an important mineral element of the heart muscles and has a direct role in reducing blood pressure. Potassium work is closely linked to magnesium work in the body, and they relax muscles, which helps regulate the mechanism of cellular regulation in this work, and the level of sodium lost from the blood must be maintained at the normal level because the increase and decrease in its concentration in the blood are inversely proportional to blood and vice versa, As well as its role in regulating the permeability of cell membrane holes." (Howler Powers, 2017) "Increased load of exercise difficulties in humans has been shown to disrupt the activity of both potassium sodium and (ATP ass), a group of enzymes that stimulate hydrolysis in the phosphate in the (ATP) molecule, and it is interesting that restoring mechanical function after exercise is slow and possibly up to days." (McKenna, 2008) and scientific facts indicate that violent exercises have undesirable negative effects on bone density, as the ossification process is negatively affected by this, and swimming is one of the sports that protect the body from losing minerals through sweating as in other sports, and thus the two biochemical processes are opposite in free swimming. Especially in high achievement exercises for a distance of (200) meters freestyle. This will lead and cause to a balance of training in determining the intensity of the training pregnancy in order to avoid health risks, and through the work of the academic and training researcher noted the need to identify the body's action with regard to these exercises and its role in supporting the formation of bone hardness in swimmers because of the importance of bones in showing strength, stability and movements in free-swimming, to aims this research in recognize on the digital values of the achievement of swimming (200) meters freestyle as an indicator of the exercises they receive by nature, the digital values of the chemical indicators of the hardness of the bones of swimmers of this distance, and to recognize the relationship, impact and contribution of these exercises to the chemical indicators of the hardness of their bones.

II. RESEARCH APPROACH:

Adopt the descriptive approach in the style of associative relationships, which are defined as "research methodology that seeks to try to determine the relationship between two or more measurable variables." (Mohammed and Osama, 2017)

The research community and its sample: The limits of the study community are represented by the elite young swimmers for a distance of (200) meters freestyle, who continue their training for the sports season (2020-2021) in the Police Sports Club and who are officially registered in the Iraqi Swimming Federation, numbering (15) swimmers, who were chosen by the intentional method with a percentage of (100%) of their community of origin because they are the community of the problem that under study.

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Measurement and research procedures: The achievement figure for a free swim (200) meters freestyle is an indicator that gives an indication of the outcome of the training that the players received within the period of special preparation for the competitions. Achievement Blood samples were drawn (5 cc) to measure the biochemical indicators related to bone hardness by conducting a laboratory test to estimate each of (calcium, magnesium, and inorganic phosphorous) as follows:

1. Measurement of calcium (Ca + 2) in the blood: - The concentration of this element was determined through the reaction of calcium ions with (O-Cresol phathalein Complex one) in the alkaline medium to form a complex in purple color, and the absorbance of this complex is directly proportional to the concentration Calcium in the model.

2. Measurement of the determination of magnesium (Mg + 2) in the blood: - The concentration of this element was determined through the reaction of magnesium ions In the base center is complex, colored with a substance (Xylidyl blue) and increased absorption is proportional to the concentration of magnesium in the serum and uses a substance (Glycoetherdiamin-N,N,N',N,-tetra acetic acid) to cancel the interactions of elemental calcium.

3. Measurement of the determination of inorganic phosphorus in the blood: The concentration of this element was determined through the reaction of inorganic phosphorus with (Ammonium molybdate) with the availability of (Sulfuric acid ), to form from this reaction a complex chemical product (phospho molybdate), The color intensity is proportional to the concentration of phosphorous.

After the tests in this survey were completed, and for the purpose of finding the relationships between the variables investigated, data for each of the 200-meter freestyle swimmers were collected, and they were processed by the SPSS system Version (V26) to extract the values of the percentage, the computational medium, the standard deviation, and the means of the linear (regression) factor model.

III. RESULTS AND DISCUSSION:
Table (1) shows the statistical parameters of variables

<table>
<thead>
<tr>
<th>skewness</th>
<th>standard deviation</th>
<th>Arithmetic mean</th>
<th>N</th>
<th>measuring unit</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.639</td>
<td>0.181</td>
<td>1.939</td>
<td>15</td>
<td>second</td>
<td>Swimming Achievement (200) M</td>
</tr>
<tr>
<td>-0.367</td>
<td>0.658</td>
<td>8.487</td>
<td>15</td>
<td>mmol/liter</td>
<td>Estimate calcium in the blood</td>
</tr>
<tr>
<td>-0.151</td>
<td>0.351</td>
<td>5.764</td>
<td>15</td>
<td>mmol/liter</td>
<td>Estimate of magnesium in the blood</td>
</tr>
<tr>
<td>0.166</td>
<td>0.644</td>
<td>7.374</td>
<td>15</td>
<td>mmol/liter</td>
<td>Determination of inorganic phosphorous in the blood</td>
</tr>
</tbody>
</table>

Table (2) showing correlation, decline and contribution

<table>
<thead>
<tr>
<th>Standard Error of Estimation</th>
<th>Contribution percentage</th>
<th>Linear Regression Coefficient 2(R)</th>
<th>Simple Correlation Coefficient (R)</th>
<th>affected</th>
<th>influencer</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.369</td>
<td>0.685</td>
<td>0.707</td>
<td>0.841</td>
<td>Serum calcium estimation</td>
<td>Swimming achievement (200) meters</td>
</tr>
<tr>
<td>0.2159</td>
<td>0.622</td>
<td>0.649</td>
<td>0.806</td>
<td>Determination of magnesium in the blood</td>
<td>Swimming achievement (200) meters</td>
</tr>
<tr>
<td>0.55814</td>
<td>0.249</td>
<td>0.302</td>
<td>0.55</td>
<td>Determination of inorganic phosphorous in the blood</td>
<td>Swimming achievement (200) meters</td>
</tr>
</tbody>
</table>
Table (3) shows the F test to examine the quality of the linear slope model reconciliation

<table>
<thead>
<tr>
<th>Indicat e</th>
<th>Grade (Sig)</th>
<th>Calcula ted F value</th>
<th>mean squares</th>
<th>Two degrees of freedo m.</th>
<th>Total squares</th>
<th>variance</th>
<th>Influencer</th>
<th>Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>0.000</td>
<td>31.409</td>
<td>4.284</td>
<td>1</td>
<td>4.284</td>
<td>regression mistakes</td>
<td>Swimming achievement (200) meters</td>
<td>Serum calcium estimation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.136</td>
<td>13</td>
<td>1.773</td>
<td></td>
<td>Swimming achievement (200) meters</td>
<td>Determination of magnesium in the blood</td>
</tr>
<tr>
<td>D</td>
<td>0.000</td>
<td>24.027</td>
<td>1.12</td>
<td>1</td>
<td>1.12</td>
<td>regression mistakes</td>
<td>Swimming achievement (200) meters</td>
<td>Determination of inorganic phosphorous in the blood affected</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.047</td>
<td>13</td>
<td>0.606</td>
<td></td>
<td>Swimming achievement (200) meters</td>
<td>Serum calcium estimation</td>
</tr>
<tr>
<td>D</td>
<td>0.034</td>
<td>5.634</td>
<td>1.755</td>
<td>1</td>
<td>1.755</td>
<td>regression mistakes</td>
<td>Swimming achievement (200) meters</td>
<td>Serum calcium estimation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.312</td>
<td>13</td>
<td>4.05</td>
<td></td>
<td>Serum calcium estimation</td>
<td></td>
</tr>
</tbody>
</table>

* Indication level (0.05) n = 15 value (F) function if the value of the score (Sig) > (0.05)

Table (4) shows the values o

<table>
<thead>
<tr>
<th>moral</th>
<th>(Sig)</th>
<th>(t)</th>
<th>standard error</th>
<th>beta</th>
<th>Variables</th>
<th>affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>moral</td>
<td>0.031</td>
<td>2.421</td>
<td>1.06</td>
<td>2.568</td>
<td>fixed limit</td>
<td>Serum calcium estimation</td>
</tr>
<tr>
<td>moral</td>
<td>0.000</td>
<td>5.604</td>
<td>0.545</td>
<td>3.053</td>
<td>Swimming achievement (200) meters</td>
<td>Determination of magnesium in the blood</td>
</tr>
<tr>
<td>moral</td>
<td>0.001</td>
<td>4.415</td>
<td>0.62</td>
<td>2.737</td>
<td>fixed limit</td>
<td>Determination of inorganic phosphorous in the blood affected</td>
</tr>
<tr>
<td>moral</td>
<td>0.000</td>
<td>4.902</td>
<td>0.318</td>
<td>1.561</td>
<td>Swimming achievement (200) meters</td>
<td>Serum calcium estimation</td>
</tr>
<tr>
<td>moral</td>
<td>0.043</td>
<td>2.237</td>
<td>1.603</td>
<td>3.586</td>
<td>fixed limit</td>
<td>Serum calcium estimation</td>
</tr>
<tr>
<td>moral</td>
<td>0.034</td>
<td>2.374</td>
<td>0.823</td>
<td>1.954</td>
<td>Swimming achievement (200) meters</td>
<td></td>
</tr>
</tbody>
</table>

Indication level (0.05) n = 15 moral value (t) if the score (Sig) > (0.05)

The results of Table (1) show that the levels of calcium, magnesium, and inorganic phosphorous need to be more balanced to ensure that swimmers maintain the solidity of their bones, and even though it's connected to nutrition on the one hand and the high efforts on the other, which are swimming achievement exercises (200) freestyle swimming meters at the current research point, the remaining percentages of contribution are determined by random unsupplied factors, which Shown by table (2) with a clear linear slope that these exercises have effects associated with the estimate levels of calcium, magnesium and inorganic phosphorous confirmed by table 3 results of the quality of reconciliation of this linear slope, and each related of the exercises of this achievement has a moral impact confirmed by the results of table 4. Also, the specificity of this study is the decreasing achieve time is preferable for swimmers, but the decreasing estimates of biochemical indicators are supposed to fit water training and not be lost in violent exercises. So the results of this research give a sign that violent exercises that take place within the anaerobic energy system in order to give swimmers a decrease in the time of achievement and get them to local and international professionalism, or even to reach them to international stadiums, does not mean the risk of weighting the minerals associated with bone hardness because this will negatively affect the production rates of muscle strength required by their bodies to resist water density on the one hand and to link speed training to muscle strength exercises, this scientific fact dictates strengthening bones and increasing their hardness to be supportive of muscle strength because their weakness or the beginning of their fragility has implications on the side of the health of swimmers and on their achievement, and since one of the physiological tasks in training is to maintain the health
of swimmers and reduce the problems of hypertraining, these results require that the training be in ripples that allow for excessive compensation not only for energy sources but also for the weighting of mineral elements, whether researched or other random factors that are not researched. “The body’s biological systems respond to external stimuli When these stimuli are of A sufficient degree of duration and intensity of the effect, and one of the body's biological responses to physical performance is the response of the skeletal muscles to this performance.” (Vassilis, 2006) "and the construction of Bone and dental depends on calcium and the body's lack of it causes osteoporosis, curvature, rickets, lack of muscle strength, contraction it, neurological pain and etc., affecting young and old alike." (Keith, 2002) As well as “almost no cell is devoid of magnesium, and its activity is largely related to the concentration of calcium in the cells.” The importance of magnesium is manifested in activating the yeasts in which glucose is formed and its importance in cell growth and proliferation, and that calcium deficiency causes tooth decay, bone curvature, rickets, deterioration in muscle strength, spasms and nerve pain. (Mahmoud, 2009) “where As exercise affects the skeleton in several ways, the direct effect of stress can increase bone mineral density and here it will prevent fragility, while violent exercises affect hormones related to bones in opposite way.” (Hamdan, Khanjer, 2009) The skeleton responds greatly to maximal stress exercises, where playing in the arm increases the intensity by about (30%) others than those who do not use it while the other real increases in bone density can be observed in the skeleton of amateur athletes in (Runners) activities, which increase in them more density in the spur, thigh, and spine area than others, while (Rowers) have a clear increase in density in the vertical spine area. (R.L. Wolman, 1994) This is what calming call to ensure bone rigidity and reduce the likelihood of fragility. "It's for swimmers to be able to progress in different tournaments, training must include stages of calm while reducing the pressures of physical loads used during the earlier stages of the training season," (Bill &Johan, 2003) (Joel & David, 2005) as "The use of the short calm phase a number of times during the training season reduces the total training volume to 50% and should not be used only if necessary." (Alqet, 2002) and "The findings the various studies reached at, about reducing the weekly volume from 80-90%, It is suitable for short calming off phases and that are less than 10 day it is also preferable to reduce the weekly training volume from 60-70 % for the longer calming stages, and In general the reducing the weekly training volume from 65-80% of the maximum weekly training volume during the season stages and for a period of 2-4 weeks which helps in the emergence of positive adaptations to the different calming phases, also, the Ranges of number of training times per week during this phase ranges from 5-6 days, which avoiding swimmers losing their ability to sense the water with an increase in the number of weekly training times.( Maglishco, 2003)

Extracts and Applications:

1. Violent exercises of the 200-meter freestyle swimmer Lead to reduce the level of biochemical indicators (calcium, magnesium, and phosphorous) that related to bone hardness.

2. The completion time of the 200-meter freestyle distance is associated, contributes and affects the level of chemical indicators (calcium, magnesium and phosphorus) which associated with bone stiffness in swimmers.

3. It is necessary to emphasize that players are not exposed to unnatural, harmful health conditions in order to measure the biochemical indicators (calcium, magnesium, and phosphorous) which related to bone hardness, and to adopt the descriptive approach for this type of research.

4. It is necessary to codify short-distance swimming training curricula within the anaerobic energy system in method that takes into account the preservation of the health status of the players’ bones, and enabling them to re-deposition the biochemical indicators related to bone hardness after high efforts in these exercises, which calls for emphasizing the ripples of the training load.
SOURCES: