



## **A strength training program for the neck muscles and its effect on the strength and accuracy of heading in football among young players**

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### **Abstract:**

significance Targeted neck muscles for good training, extensors, and trunk muscles in facilitating precise heading in football is gaining more attention. These muscles play crucial roles in establishing traction between the torso and head during ball contact, thereby augmenting physical mass at impact and mitigating head acceleration. Consequently, Manuscript aimed to scrutinize the impact of Six weeks of neck training on enhancing heading performance among young football players.

### **Introduction:**

Many studies have shown that development in strength and muscle mass in Neck exercises reduce risk of injury and a factor in reducing concussions, which is currently quite relevant various sports, including football [3]. most studies currently devoted to studying the effect of strength training on neck muscles and prevention of injuries in players. However, the issue of the influence of such training on

increasing the efficiency of heading in football players has not been sufficiently studied.

Neck strength is another element thought to influence head acceleration during headers [4], as soccer players activate their neck increase their effective mass in anticipation of head contact with ball [5]. A systematic review [4] found a relationship between peak isometric neck muscle force and lower head acceleration during goal-directed head movement. Upper neck muscle strength is hypothesized reduce head acceleration during heading by controlling head movement and increasing head and trunk stability to prevent the head from rolling back or side during head collision with the ball [6].

setup phase, trunk muscles are responsible for accelerating trunk and head, pulling arc of the body in order to achieve maximum acceleration sufficient for football. neck muscles extensors, in particular, must ensure that trunk and head are in contact during ball contact, body mass striking ball increases and head acceleration decreases [2]. According to this, stronger neck muscles and extensor muscles would theoretically provide better anatomical connections and perhaps make heading safer in football.

### **1- Purpose of the study**

The manuscript was intended the Six weeks of neck training regimen on enhancing heading performance in young football players.

### **2- Method and Procedure:**

Experimentation was conducted with one group



## 2-1 Research Sample:

An experimental investigation was undertaken to assess the influence of neck strength training on heading technique in football. Participants comprised football players aged 17-19 years from the Diwaniya football club. The study involved 10 players in both the experimental and control groups selected from this club.

Prior to the pedagogical experiment, control tests were conducted to assess the impact of existing methods enhancing heading technique on the proficiency of this technical skill. A test was then conducted for the control and experimental groups with the variables of the study, and data that was suitable for dealing with them statistically was extracted.

## 2-2 Tools and equipment used in research:

football field

Footballs

Metric tape measure

Signs

Colored adhesive tape

A football goal with accuracy test squares on it

Photography cameras

dumbbell and lateral



## 2-5 main experiment

### 2.5-1 Pretest:

the two study groups were tested on Friday and Sunday at 4 pm at Diwanayah Club Stadium and were tested on the two variables of the study (Neck exercises).

### 2-5-2 Training Curriculum:

After completing baseline testing, the experimental group engage in a six-week neck strength program three times per week.

#### **The following exercises were used as part of the preparation:**

1. Shoulder Raise: One of the popular resistance exercises that can be done Using weight exercises. It is in a velvet glove an athlete carries the weight of each hand, extend arms out to sides, raise shoulders, lift weight, slowly relax back to start position.
2. Weight exercise: When pressing dumbbells, Lifts his arms and his elbows are at level of his shoulders and bent angle of approximately 90 degrees. From this starting position, the athlete then raises the dumbbell toward the ceiling with the elbow straight. Then the dumbbell returns to its original position.
3. Neck exercises with lateral, front, back and rotational resistance. Athletes who compete for teams with significant resources often have equipment Specially designed to strengthen neck. However, very simple weightlifting exercises that.

resistance exercises, athlete places right hand on the right side of head. then flex neck muscles, causing right ear to move toward right shoulder. However,



athlete resists this movement, ensuring that head remains stable. This position is held with active resistance for five seconds. The exercise can be repeated on the left side of head, front, and back of head for comprehensive training of the neck muscles.

Rotation resistance exercises are similar: athlete places hand on forehead and then tries turn his head right or left while gesturing “no.” hand resists this movement, no movement of head. Again, athlete remain active resistance position for five to ten seconds and then repeat opposite direction.

### **2-3-2 Post-test:**

After completing the application of the components of the training curriculum, the researcher conducted the post-test for the experimental and control groups, in addition to taking performance data under the same conditions as the pre-test.

### **2-6 Statistical means:**

The statistical package was used to extract the study data

### **3- Presentation, analysis and discussion of the results:**

#### **3-1 Introduction and discussion of the pre- and post-test results of relevant proficiency tests.**

Participants completed the number of repetitions and sets presented in Table 1 for each of the highlighted exercises.



(Table 1)

Results of tests on the for–strength training during the six–week protocol of impact in the experimental and control groups

Week	Repeats
Week 1	10
Week 2	12
Week 3	15
Week 4	10
Week 5	12
Week 6	15

Control tests. To evaluate the effectiveness of the proposed training program, control tests were conducted in the experimental and control groups. Testing was carried out according to the following indicators:

1. Long range header. The sum of the ball's flight distance in meters characterizes the quality of the exercise.

2. Header for accuracy from the line of the penalty area into a goal divided into three parts. The ball must cross the goal line in the air. For hitting the outer zones (2 m) 3 points are awarded, for hitting the middle zone – 2 points, and hitting the bar – 1 point. Five hits are given. To count – the total amount of points

3. Correct execution of the technique of hitting the head (with the middle of the forehead in a jump) Hit with the middle of the forehead in motion, in a jump, with a ball flying towards you. The technique of getting under the ball and the technique of hitting the head are assessed. Three attempts are given. The results are assessed on a 5–point scale.

The results of control tests at the initial and control stages are presented in

Figure 1.

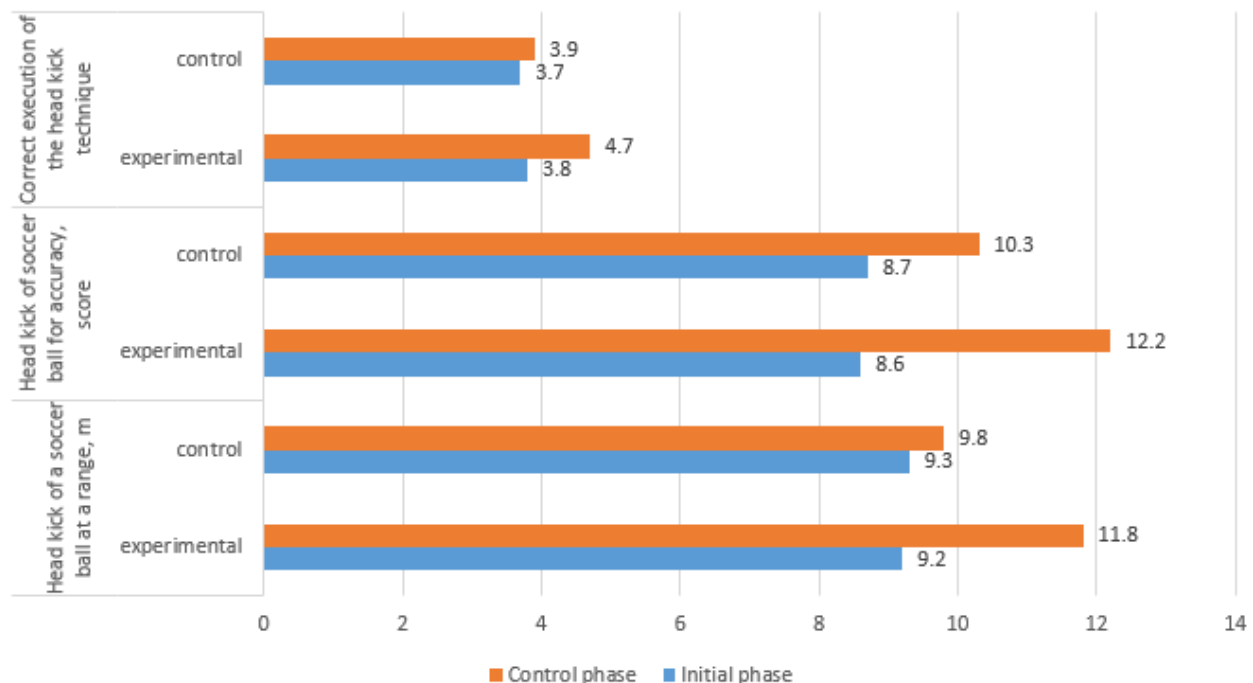


Figure 1 — Dynamics of testing indicators for head kicks

During the initial phase of the study, it was observed that there were no significant differences in the indicators between the experimental and control groups. However, subsequent diagnostics revealed that the control group exhibited minimal improvement in indicators across all selected tests. In the experimental group, one can note the presence of positive dynamics after the implementation of the training program. The impact range increased by  $2.6 \text{ m} \pm 6\%$ , which was revealed during control tests at the final stage. To identify the significance of differences, the Wilcoxon T-test was used, which showed the presence of statistical significance in the experimental group (Temp =10.8\*\* at  $P \leq 0.05$ ). However, no significant differences were found in the control group.

Analysis of the results on the accuracy of head strikes also showed that in the experimental group the average indicator increased by  $3.66 \pm 5\%$ , in the control group only minor changes were noted. Correlation analysis using the Wilcoxon T-test also showed the presence of significant differences in the experimental group (Temp =10.1\*\* at  $P \leq 0.05$ ). However, no significant differences were found in the control group.

The results for the third indicator – performing the head-butting technique – also showed positive dynamics in the experimental group. Thus, the average values increased by 0.9 points compared to the initial stage. While no significant changes were detected in the control group. To identify the significance of differences, the Wilcoxon T-test was used, which showed the presence of statistical significance in the experimental group (Temp =9.8\*\* at  $P \leq 0.05$ ).

#### 4.1 Conclusions



The current study investigated the impact of neck muscle strength training on heading performance in young football players. Results from control tests revealed statistically significant differences in tests among football players from the control group who underwent the program implementation. Conversely, no significant improvements were noted in the control group following standard training. These findings suggest the effectiveness of neck muscle strength training in the development of young football players.

#### 4.2 Recommendations

1. Improving the accuracy of head play, as well as preventing possible injuries, is carried out through special strength training, which is aimed at strengthening the neck muscles.
2. The following exercises can be used as part of this workout: shoulder lifting, dumbbell press, neck exercises with lateral, anterior, posterior and rotational resistance.
3. An effective training complex is from 6 weeks, after which positive results are observed when performing control exercises.

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