

EFFECT OF FRENCH CONTRAST TRAINING ON BONE MINERAL DENSITY AND COMPLEX SKILLS PERFORMANCE FOR SOCCER PLAYERS

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Abstract

Purpose. Soccer sport develops a remarkable development in all parts of the world day after day, the purpose of this study is to explore the effect of French contrast training on bone mineral density and complex skills performance for soccer players.

Methods.

A sample consisting of (31) soccer players was deliberately chosen from football players at Badr Sports Club, and some (6) players were excluded due to the irregularity of some of them (4) and the injury of two (2), thus the total of the research sample (25) player, (5) players were excluded for conducting the survey on them, so that the actual sample of the research sample became (20) players, they were divided into two equal groups, one is experimental and the other is a control and the number of each is 10 players. They all participated voluntarily.

Results.

Statistical analyses showed that:

- Significant Difference between the experimental group and control group in certain physical variables.
- Significant Difference between the experimental group and control group in complex skills variables.
- Significant Difference between the experimental group and control group bone mineral density variables

Conclusions.

Under the conditions of our study, French contrast training to 10 weeks resulted in an increase in power, bone mineral density and performance of complex skills for soccer players. These results must be considered by coaches to better understand and implicated of these concepts for technical effects of training.

Key words: French Contrast Training, Bone Mineral Density, Soccer.

Introduction

Soccer sport develops a remarkable development in all parts of the world day after day, due to the fact that workers in its field take the scientific method as a path for them in its various fields, whether in the field of training, management, medical or physical therapy or any other field that helps to improve the level of players and the team .

(A. Hassan, 2004) indicates that the special physical abilities in soccer constitute an important and essential factor to raise the level of skill performance, as the physical abilities aim to identify certain physical elements that play a prominent role in the player's mastery of basic skills, and soccer as one of the collective sports activities is one of Technical sports that contain a large number of motor skills that need a large amount of physical capabilities and capabilities for each are carried out in a good style and sound technical performance.

(A. Albosaty, 2001) states that the physical data of the kinetic activity of the soccer player during the match indicate a continuous dynamic of

the fitness elements in general represented by aerobic and anaerobic endurance and both speed and strength of various kinds as well as flexibility and agility, and the higher the level of these elements the higher the player's ability To make effort and give for 90 minutes without a drop in the technical level (skillful - plans).

He adds that the basic planning principles or the basic plans represented in the support - the ability to move and spread - changing positions - penetration - depth - breadth in width - numerical density in the ball region etc, depends primarily on the level of the player's physical capabilities.

(A. Hassan, 2004) notes that skill performance plays a large role in modern soccer in achieving positive results for the team and directly affects the process of mastery and success of the way the team plays, which leads to confusion of the opponent and his inability to control the course of play and performance. And that the skill setting in soccer aims to teach the basic skills that the player uses during matches and competitions and try to master and install them so that the highest levels

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can be achieved.

The nature of performance in soccer is distinguished by that it contains many and varied skills that players must master, with or without the ball, to achieve superiority over its competitor. Therefore, training in these skills occupies a concrete time frame in the program for preparing and training young and old soccer players.

(E. Mark, 1997) and (A. Muhammad, 1994) also agree that the development of special physical abilities is closely related to the development of basic motor skills and that a sports individual cannot master basic motor skills for the type of activity from which he specializes if he lacks the necessary physical capabilities for this activity, and he adds that The distinctive nature of the basic motor skills of the specialized activity is what determines the necessary physical capabilities that must be developed and developed to reach the highest possible level in this activity.

(K. Mohamed & A. Albosaty, 2000) states that soccer is an activity with variable situations that are distinguished by the variation and complexity of the nature and conditions of competition in it, as well as it contains multiple technical skills that the player must implement from the movement to overcome the speed and strength of the opponent's swooping and that in order to improve the speed and accuracy of compatibility The kinetic of the soccer player needs to develop different combinations of skill performances. He has any form of special skills performance that the player frequently performs during the game with different kinematic sequences.

(I. Muhammad, 2004) states that the player who does not master the complex performance focuses on the ball and the way it plays more than its focus on the planning side and with the player's focus on playing the ball he cannot notice accurately the actions of his teammate or competition on the field, which undoubtedly affects the accuracy of his implementation of the principles Schematic.

(H. Amr & E. Naglaa, 2018) indicate that coaches are constantly looking for modern training methods to improve these specific characteristics so that their athletes succeed in field competitions. One of these methods that has become popular during the past four years is the French contrast method.

Gilles Cometti, the American athletics coach, is the innovator of the French contrast method, and Carl Dietz and Ben Peterson (2018) explained and interpreted them in their Triphasic Training book. (23)

French contrast is subject to the phenomenon of Post Activation Potentiation (PAP), and in this regard Contreras, (2010) indicates that

the phenomenon of strengthening after activation is described as a physiological phenomenon in which an intense series of voluntary muscle contractions is produced that produce temporary increases in peak power and strength while performing explosive activities .

(M. Lesinski, et al. 2013) that although strengthened after activation has been used for several decades by trainers with the aim of enhancing strength, only recently has this phenomenon been closely examined.

They adds that the exact physiological components that can contribute to this response are still controversial, and there are several proposed mechanisms that can be attributed to this form, all of which are linked to increased stimulation of the central nervous system.

(N. Tillin, &D. Bishop, 2009) notes that severe muscle contractions result in phosphorylation of light myosin chains and thus increase the sensitivity of actin and myosin filaments to calcium, which in turn creates stronger contractions, as there is a greater response to the released calcium during the contracting process.

While (R.L. Lieber 2009; K.McCully 2012) adopts the second proposed mechanism that relies on the idea that severe muscle contractions release more calcium for every possible action and thus increase the strength and torque of subsequent contractions.

Cal Dietz and Ben Peterson (2012) note that the French contrast method performs with a protocol consisting of four exercises, in which the physiological response to the athlete is greater than usual, forcing the muscle to increase the ability.

(A. Joseba, et al. 2018) that the French contrast method (FMC), makes the athlete strong for longer periods of time, which stimulates greater strength adjustment. It is an effective and less time-consuming strategy for improving physical performance, which is currently applied in sports that require high levels of ability and nervous and muscular strength.

Cal Dietz and Ben Peterson (2012) explain that the four consecutive exercises that make up the French contrast method (FMC) are a resistance exercise (weights) that are performed at almost the maximum load, followed directly by a plumeric exercise that simulates the same movement pattern, then a resistance exercise to try to maximize energy production, Finally, do a plyometric exercise or acceleration.

(A. Joseba, et al. 2018) Maximum strength and vaulting exercises support athletes' ability to produce high levels of ability and muscle strength, which are critical to successful performance in sports. Using the French contrast method (FMC) in

training may be an effective way to improve the lower-end strength and strength.

Physiological changes, as indicated by (A. Abu El-Ela, 2003), are among the main topics for workers in the field of sports activities and sports training, through which it was possible to identify the effect of sports training methods on the vital systems of the athlete's body.

(M. Cole, 2008) indicates that there are statistics indicating the relationship between weak bone density and high probability of fractures, and that fractures of the legs and pelvis due to falls are among the most important problems as they lead to increased medical costs, the inability to live independently and stop exercising.

(A. Abu El-Ela & N. Ahmed, 1993) indicates that the reactions of the human body and its various vital organs under the influence of sports training are among the most important issues of specialized scientific research in the sports field.

(K. Witch et al. 1998) also shows that there are many questions related to the effect of the form and nature of athletic performance on bone mineral density, in addition to the fact that we still do not know the cause of bone adaptation resulting from training.

(K. Jack, 2003) shows that exercise contributes to supplying the great tissue with the mineral elements needed in its construction. Exercise also helps in stimulating the bone marrow, which is the factory that produces red blood cells. Therefore, the production of bone marrow and red blood cells increases with exercise.

The bones, as (A. Izz, 1991) points, is a tissue that needs food. It also needs training, especially strength training, to help in the process of good growth. It indicates that exercises increase the density of bone minerals by depositing more salts, which increases their strength. And that the bones are affected by the process of stress and pressure on them.

Through the researcher's briefing on the (Internet), They noticed, within the limits of her knowledge, the absence of a foreign or Arab study that linked the French contrast training (FMC) and physical changes in soccer.

Studies dealing with the French method of variance (FMC) were all foreign, only one Arabian study in athletics to Naglaa Elbadry, et al. 2019, entitled The effects of the French variance training on the explosive strength and the kinematic variables of the triple jump competition, on a sample of (10) players for a high level triple jump, and the most important results were an improvement in the explosive strength variables, kinematic variables and the digital level of the triple jump competition.

The researcher believes that soccer is one of the sports in which players are exposed to high pressures on the great apparatus, whether during training or in competition, which increases the possibility of the risk of broken bones and avoids exercise.

the purpose of this study is to explore the effect of French contrast training on bone mineral density and complex skills performance for soccer players.

Methods.

A sample consisting of (31) soccer players was deliberately chosen from football players at Badr Sports Club, and some (6) players were excluded due to the irregularity of some of them (4) and the injury of two (2), thus the total of the research sample (25) player, (5) players were excluded for conducting the survey on them, so that the actual sample of the research sample became (20) players, they were divided into two equal groups, one is experimental and the other is a control and the number of each is 10 players. They all participated voluntarily.

Devices and tools used

- Calibrated medical scale to measure weight in kilograms.
- Restmeter to measure lengths
- Stopwatch
- Hurdles.
- Boxes.
- Soccer balls.
- Divided Goal
- cones.
- Collars
- tape measure
- Whistle.

Complex skill performance tests:

3 complex skill performances were chosen as follows:

- Receiving, running with the ball, then swiping
- Receiving, dribbling, and passing
- Receiving, dribbling, and shooting

Physical variables tests:

- Standing Long Jump Test
- The triple jump in both feet
- 5 x 30m
- Maximum dynamic strength of the legs muscle

DEXA device for measuring bone mineral density

(B. Richmond, 2007) notes that it is painless and subject to a little radiation, these measurements are examined in two areas: the lower back of the spine and the upper area of the pelvis (femur)

Statistical treatments:

The researchers used the following statistical treatments:

- Average
- Ratios of improvement
- T-test

Training program settings:

- ◀ Duration of the program (10) weeks.
- ◀ The number of weekly training units (3)

◀ The total number of training units (30) training units.

units.

Results

Table 1. Anthropometric Characteristics and Age of the subjects (Mean ± SD)

Group	N	Age [years]	Weight [kg]	Height [cm]
Experimental	10	21.17 ± 1.4	79 ± 3.9	178 ± 4.82
Control	10	21.09 ± 1.6	75 ± 4.1	179 ± 5.00

Table 1 shows the Anthropometric Characteristics and Age of the subjects. There were no significant differences observed in these variables.

Table 2. Mean ± SD and "T" Test between the two Groups (experimental and control) in certain physical variables

Variables	Experimental group	Control group	Sign.
	After	After	
Standing Long Jump Test	2.41 ± 0.68	2.32 ± 0.57	S
The triple jump in both feet	6.65 ± 0.46	6.21 ± 0.11	S
5 x 30m	4.25 ± 0.05	4.95 ± 0.08	S
Maximum legs dynamic strength	95.70 ± 3.67	90.05 ± 3.49	S

Table 2 shows that:

- Significant Difference between the experimental group and control group in certain physical variables.

Table 3. Mean ± SD and "T" Test between the two Groups (experimental and control) in complex skills variables

Variables	Experimental group	Control group	Sign.
	After	After	
Receiving, running with the ball, then swiping	2.95 ± 0.53	2.27 ± 0.29	S
Receiving, dribbling, and passing	2.78 ± 0.46	2.21 ± 0.11	S
Receiving, dribbling, and shooting	2.81 ± 0.05	2.12 ± 0.15	S

Table 3 shows that:

- Significant Difference between the experimental group and control group in complex skills variables.

Table 4. Mean ± SD and "T" Test between the two Groups (experimental and control) in bone mineral density variables

Variables	Experimental group	Control group	Sign.
	After	After	
BMD (Femur Neck)	1.35 ± 0.03	1.27 ± 0.09	S
BMD (L2-L4)	1.18 ± 0.05	1.09 ± 0.08	S

Table 4 shows that:

- Significant Difference between the experimental group and control group bone mineral density variables.

Discussion

The aims of the current study were to explore the effect of French contrast training on bone mineral density and complex skills performance for soccer players.

The researcher attributes these differences to the fact that the French variation exercises increase the area of the muscular section and the diameter of the thick muscle fibre in the trained muscle through the French variation exercises so the muscle fibre grows with an increase in the actin and myosin filaments with the decrease accompanying the sarcoplasm and thus increasing the amount of protein in the muscles, which leads To muscle tone, and this is confirmed by Song, (1990) in that

physical exercise regenerates and consumes whole protein in the body.

This is consistent with (A. Essam, 2005) that physical preparation affects all young adults by developing their physical and motor abilities of muscle strength, endurance, speed, agility, flexibility, and their compounds such as strength marked by speed and endurance.

The researcher believes that the muscular strength in its various forms, including the maximum muscle strength and the muscular ability and endurance of strength are considered one of the most important components of muscle fitness for soccer players, as players must continue to perform with the same strength and without fatigue, and this will not be achieved unless there is an appropriate

level of strength and endurance of strength, which led to The positive effect on the combined skill performance of the research sample.

(H. Amr, 2012) believes that the relationship between the basic skills of any sport and its different physical requirements (public, private) is a close relationship that must be taken into account when preparing the players, and that there is no separation between the skilful and physical settings, but on the contrary the elements must be developed Physical fitness in line with skill requirements, this achieves success in the training process and thus raise the level of players, when the player possesses physical qualities with a high degree can perform all skills well.

This is consistent with (K. Mohamed & A. Albosaty, 2000;H. Vivan , 2003) states that training in complex kinematic performances in conditions and situations similar to performance The actual matches (my position training) lead to a shortening of the total time for the skill performance that requires speed as well as accuracy to achieve the desired purpose, as well as the study of (H. Amr 2012) where the physical elements (speed - strength) increase with significant differences.

This is confirmed by (A. Hassan, 1994) that the muscle strength is the basis for the individual's access to the highest levels of heroism, as it greatly affects the development of some physical characteristics such as speed, endurance and agility.

The researcher attributed the improvement of the force variables to the good planning of the French contrast training program and the codification of the training loads in a scientific manner appropriate to the Sunni and training phase of the research sample and to the use of plyometric exercises as a major part in French contrast training with the aim of developing explosive power.

In this regard, (H. Talha, et al. 1997) confirm that the distance of the wide jump depends on the number of raised fibres, the higher the number of fibres, the greater the amount of ability to perform more, as well as the muscles and their tendons. In order for the player to reach the maximum distance, all the muscle fibres of the muscles involved in the work must be raised to the maximum The degree and the highest rate, as well as the muscles and tendons must be in a state of tightening before the occurrence of contraction to take advantage of the rubber energy that is enjoyed by the plyometric exercises.

(H. Mufti, 2000) agrees with that, noting that although the exercises have no relation to the length of the bones, they do occur in an increase in the width and density of the bones by depositing more salts on it, which increases their strength and that the bones are affected by the process of stress and pressure on them. Exercising, as Jack (2003)

indicates, helps stimulate blood circulation in the great tissue and emphasizes the importance of exercise in achieving bone stiffness.

This is confirmed by (K. Adams, et al. 1992) that the rubber reflection activity allows excellent transfer of the explosive force to the same mechanically similar movements that require a high capacity of the trunk and legs, and its results are shown when performing the wide jump.

The researcher attributes this improvement in the level of maximum strength to the fact that the French contrast exercises are directed directly to the development and development of maximum strength, which is one of the special physical capabilities required by performance in soccer, for strong muscles necessarily have to be fast muscles. The researcher attributed this improvement to the diversity in the choice of French contrast training for arms and legs and its distribution during the program periods according to the goal of each period. Motor units, which leads to the participation of a large number of them, resulting in a strong and rapid contraction that increases the explosive performance in addition to the response of the muscle spinners in the muscles, through which the efficiency of the elastic force of the muscle can be determined, which depends on the efficiency of the reflected response to the sensory receptors of the extensor muscles of the joints, and this occurs during Constriction for prolonged jumping or throwing.

This is confirmed by (A. Joseba, et al. 2018) that French asymmetry exercises stimulate muscle spinners, which results in high tension in the liberating motor units and stimulation of other receptors that increase the number of active motor units, which are the reason for the increase in the resulting strength.

The researcher took into account during the performance of the biometric exercises the shortening of the time of contact with the feet or arms of the ground, where the player bouncing immediately after the ground touching the feet or arms, where the biometric training reduces the time of the muscle contraction, and this is consistent with what was mentioned by Diallo, et al. (2001) that decentralized contractility must be immediately followed by a centralized contracting in order to obtain high systolic productivity.

The researchers took into account the interest in stretching muscles and flexibility of the joints so that the muscles and joints become fully prepared to perform the French contrast exercises efficiently without causing injuries, and the French contrast training has improved the muscular capacity of the two men. The researcher attributed this to the French contrast exercises that were designed and developed to improve the muscular capacity of the

legs and torso. The researcher believes that the use of French contrast exercises in a proper and regular way led to a decrease in the contracting time of the muscle fibres and an improvement in the compatibility between the working muscles and the corresponding muscles.

This is consistent with what (A. Joseba, et al. 2018) French contrast training is one of the types of exercises that contribute to improving some special physical abilities, the most important of which is muscle ability and acceleration.

The results of the study are consistent with those of (A. Joseba, et al. 2018; W. Mathew, et al. 2018; S. Juliano, et al. 2019; E. Naglaa, et al. 2019) that French contrast exercises contribute to improved jump performance, muscle strength and acceleration time for the experimental group.

Tillin, & Bishop (2009) emphasizes that the increase in the employment of kinetic units induced by heavy loads or high-intensity short-range movements results in an increase in the number of kinetic or enlisted units (higher threshold motor units) in addition to an increase in the rate of launch of those kinetic units.

Conclusion

Under the conditions of our study, French contrast training to 10 weeks resulted in an increase in power, bone mineral density and performance of complex skills for soccer players. These results must be considered by coaches to better understand and implicated of these concepts for technical effects of training.

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