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No.	Title	Page
1	CAVITATION RADIO FREQUENCY VERSUS MESOTHERAPY ON ABDOMINAL ADIPOSITY	1-7
2	CREATIVE QUALITIES AND THEIR RELATIONSHIP TO ACCURATELY PERFORM SOME OF THE BASIC SKILLS OF VOLLEY BALL FOR THE STUDENTS OF THE COLLEGE OF PHYSICAL EDUCATION, UNIVERSITY OF KARBALA	8-13
3	EFFECT OF PUBERTAL MATURATION ON THE DEVELOPMENT OF ANAEROBIC POWER IN COLLEGE STUDENTS 11-16 YEARS OF ALGERIA	14-18
4	FORECASTING CROSS FITNESS TEST OWN FOOTBALL RULES, ACCORDING TO SOME PHYSIOLOGICAL VARIABLES	19-23
5	IMPACT ON THE DEVELOPMENT OF PRACTICAL LESSONS FITNESS CARDIOVASCULAR SYSTEM VASCULAR TO STUDENTS OF THE FACULTY OF PHYSICAL EDUCATION MUSTANSIRIYA UNIVERSITY	24-27
6	RELATIONSHIPS BETWEEN ILLINOIS AGILITY TEST AND REACTION TIME IN MALE ATHLETES	28-33
7	ROBOT ENHANCED THERAPY FOR IMPAIRED UPPER EXTREMITIES FUNCTIONS IN HEMIPLEGIC CHILDREN	34-39
8	THE DESIGN OF THE ISSEP TUNISIAN TEACHERS ABOUT THE LMD REFORM CASE ISSEP TEACHERS OF SFAX	40-44
9	THE EFFECT OF SPORT DIVING ON STEM CELLS CD34+ AND COMPLETE BLOOD PICTURE	45-49
10	THE EFFECT OF THE BIOMECHANICAL ANALYSIS TO INCREASE SPEED ACCORDANCE WITH THE CENTRIFUGAL FORCE OF THE DIFFERENT AREAS OF THE COMPLETION OF THE ENEMY OF THE 200M CURVE	50-54
11	THE IMPACT OF A PROPOSED REHABILITATION APPROACH USING SOME OF THE TOOLS AND THERAPEUTIC EXERCISES TO REHABILITATE THE MUSCLES OF THE LOWER LIMB INJURIES BASKETBALL PLAYERS (YOUTH)	55-61
12	THE IMPACT OF COMPARATIVE COMPETITION METHODOLOGY TO DEVELOP SOME FLOOR EXERCISES AND DEVELOPMENT OF INTELLECTUAL FLUENCY FOR KINDERGARTEN CHILDREN	62-65
13	THE IMPACT OF NON- OXYGEN PHYSICAL EFFORT TO CHANGE SOME OF THE SALTS OF THE BLOOD AND THE ACCURACY OF SOME TYPES OF CORRECTION BASKETBALL FOR MEN	66-68
14	THE IMPACT OF THE INTERFERENCE OF SOME EXERCISE METHODS IN LEARNING THE STUDENTS TWO SKILLS OF HANDLING AND PEACEFUL SCORING IN BASKETBALL.	69-74
15	THE IMPACT OF THE USE OF COOPERATIVE EDUCATION STYLE IN LEARNING SOME BASIC SKILLS FOR HANDBALL AND ACADEMIC LEARNING TIME	75-78
16	THE ROLE IF PHYSICAL EDUCATION AND SPORT IN THE DEVELOPMENT OF SOME LIFE PHYSICAL CAPACITIES IN MIDDLE SCHOOL	79-84
17	WELLNESS AND FITNESS	85-87

# CAVITATION RADIO FREQUENCY VERSUS MESOTHERAPY ON ABDOMINAL ADIPOSITY

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## Abstract

The purpose of the study is compare between cavitation radiofrequency and mesotherapy on abdominal adiposity. 45 obese subjects of both sexes ranged in age from twenty five to forty five years participated in this study were selected from specialized center for obesity and categorized randomly into 3 groups of equal number (each group 15 subjects). Group A received (cavitation radiofrequency and diet), Group B received (mesotherapy and diet), Group C received (diet only) all groups were observed for 6 weeks. Body weight, height, waist hip ratio and skin fold were measured before and after intervention.

Results: There was significant improvement in the three groups in waist circumference, waist hip ratio, and suprailiac skin fold in favor of cavitation radiofrequency group, with no significant difference in body weight and BMI in the three groups after intervention.

Conclusions: Cavitation radiofrequency is more effective than mesotherapy in reduction of abdominal obesity.

**KEYWORDS: Abdominal adiposity. Cavitation radiofrequency. Mesotherapy.**

## 1. INTRODUCTION

Abdominal obesity, also known as beer belly, beer gut, pot belly or clinically as central obesity, is when excessive abdominal fat around the stomach and abdomen has built up to the extent that it is likely to have a negative impact on health. There is a strong correlation between central obesity and cardiovascular disease.(1) Abdominal obesity is not confined only to the elderly and obese subjects.(2) Abdominal obesity has been linked to Alzheimer's Disease as well as other metabolic and vascular diseases.(3)

While central obesity can be obvious just by looking at the naked body, the severity of central obesity is determined by taking waist and hip measurements. The absolute waist circumference (>102 centimetres (40 in) in men and >88 centimetres (35 in) in women) and the waist-hip ratio (>0.9 for men and >0.85 for women) are both used as measures of central obesity.(1)

High-intensity-focused ultrasound cavitation (HIFU) is a promising clinically relevant, thermal ablation technique that allows minimally invasive treatments while not necessitating the insertion of a probe into the target tissue, the hallmark of a true noninvasive procedure. Instead the source device in HIFU is placed on the surface of the body. The high-powered beam of ultrasound generated does not harm the tissues it traverses, but focuses at a predetermined focal point to enable selective destruction of targeted subcutaneous adipose tissue leaving surrounding tissues intact. This ensures trackless ablation of target tissues without the insertion of an applicator into the target area thus allowing for increased patient comfort and acceptability compared to traditional liposuction procedures. This noninvasive ablation procedure offers several advantages in that it allows the movement of the source device to target different tissue, while procedures that require probes to be inserted are only able to target tissues in its immediate vicinity. Furthermore, the wound healing response attracts fibroblasts into the area, which together with heat denaturation of collagen that has occurred during the HIFU procedure, induces the formation of new collagen and tightening of septal fibers potentially resulting in a skin tightening effect.(4)

Once adipocytes have been ablated with HIFU, macrophages are attracted to the area to engulf and transport the lipids and cellular debris. This removal results in an overall reduction in local adipose tissue volume. The HIFU is an attractive alternative to more invasive procedures for body contouring that may appeal to patients resistant to surgical options. It does not require general anesthesia and can be performed as an outpatient procedure thus substantially cutting treatment cost, recovery time, and decreasing the risk of side effects, complications, and patient discomfort.(5)

Radiofrequency (RF) technologies, which use electrical current, have been introduced as a new approach for the purpose of body contouring although for local fat disruption. Radiofrequency treatments are procedures involving the use of a radiofrequency energy device to heat up and tighten tissue to boost blood flow and break down cellulite and fat. The radiofrequency energy heats the skin without damaging it, in order to break down fatty cells and stimulate collagen production, which improves skin tone and elasticity. Radiofrequency treatments can be used to treat excess pockets of fat on the abdomen, hips and thighs, reduce cellulite and tighten saggy skin caused by weight loss or pregnancy. The treatment is very safe and has minimal downtime.(6)

Mesotherapy treatment is a non-surgical cosmetic solution aimed at diminishing problem areas in the body such as cellulite, excess weight, body contouring, and face/neck rejuvenation. It is administered via numerous injections containing various types of FDA

approved medicines, vitamins, and minerals. It is introduced into the mesoderm, the layer of fat and tissue underneath the skin. The content mixture of the injection varies in accordance with each unique case and specific area to be treated.(7)

Up to our best knowledge there is a wide gap in literature regarding the comparison between cavitation radiofrequency and mesotherapy on subjects with localized abdominal adiposity. The importance of the study to both the overweight subjects and clinicians; it will help the overweight subjects to knowing the best and the safer way that effect on their abdominal obesity. On the other hand, clinicians will be able to find out the most effective way that effect on the abdominal obese subjects.

## 2. MATERIAL AND METHODS

This study was conducted in specialized center for obesity, to investigate the effect of cavitation radiofrequency versus mesotherapy on abdominal obese subjects. The design of the study was pre-test post-test design. 45 subjects of both sexes (16M-29F) were assigned randomly into three groups of equal number (each group 15 subjects). They randomly selected from population according to the following criteria: Their ages was ranged from 25 to 45 years. They had no current or previous neurological or musculoskeletal Disorders, non-pregnant females and with normal liver functions. Their body mass index (BMI) of less than 30 and an abdominal fat thickness of at least 2.5 cm prior to treatment as measured by commercial pinch caliper. They can understand and follow verbal commands and instructions included in the test. Subjects randomly assigned into 3 groups. Group (A) consisted of 15 subjects (6 male and 9 female) abdominal obese were received cavitation radiofrequency and diet. Group (B) consisted of 15 subjects (5male and 10 female) abdominal obese were received mesotherapy and diet. Group (C) consisted of 15 subjects (5male and 10 female) abdominal obese were received diet only.

### INSTRUMENTATION:

**1- Weight and height scale:** Hanson professional scale was used to measure weight and height in order to calculate the body weight.(8)

**2- Tape measurement:** To measure the waist and the hip circumference.

**3- Skin fold calipers:** To measure the Skin fold at the waist (Suprailiac) level.

#### Procedure:

**a) Initial preparation:** All subjects agreed to participate in the study by completing an informed consent form.

#### b) Assessment procedures:

**I- weight assessment:** - All groups were their weight measured by the Hanson professional scale.

**II- Waist-to-hip ratio measurement:-** Each subject assessed by the tape measurement and tacked the waist and the hip circumference then Divide the waist measurement by the hip measurement. Abdominal obesity is typically measured by waist circumference; a measurement of 40 inches or more in men and 35 inches or more in women indicates abdominal obesity.(9)

**III- Body mass index (BMI) :-** weight (in kilograms)/ [height of power 2 (in meters)].(8)

**VI-skin fold calipers:-**subject assessed by the calipers and tacked the waist (Suprailiac) region fat. This is located just above the iliac crest, the protrusion of the hip bone, a little towards the front from the side of the waist. The fold is taken approximately horizontally

#### c) Treatment procedures:

**I- group A** was received cavitation radiofrequency sessions and diet ( one session every week for 6weeks 60 minute ).Cavitation conditions .Pressure - 0.6 kPa .Vibration frequency - from 39-41 kHz (thus achieving a more profound impact - 8-10 cm) for 40 minutes using (UltraShape Syneron System . device)(10).

Bipolar RF treatment was applied for 20 minutes immediately after the focused ultrasound treatment in all subjects. The RF frequency mode used was 0.8 MHZ which is suitable for deep layer (15-18mm) treatments. Using (Velashape III , Syneron Medical Ltd, device)(11).Both cavitation and radiofrequency done from supine lying position and subject was completely relaxed.

**II-group B** was received mesotherapy injection composed of (phosphatidylcholine (PC) and deoxycholate (DC),lidocaine, aminophylline, conjugated linolenic acid, L-carnitine,isoproterenol, yohimbine, pentoxiphylline, and collagenase) and diet ( 1 session per week for 6 weeks ). Subjects was injected by will trained physician have an experience more than 10 years in mesotherapy with one-half-inch needles with the injections placed one-half inch apart using multi injector over the abdominal area.(12,13,14)

**III- group C** was received diet only for 6 weeks. The diet prescribed for the 3 groups was a balanced hypocaloric diet that provided 1500 to 1800 kcal daily according to the requirement of each subjects. The menu varied according to the subject age and eating habits. It was low in fat (20% to 25%), high in complex carbohydrate (50% to 60%), and sufficient in protein (25% to 30%). No vitamins or other nutritional supplements were prescribed. (15)

#### Statistical analysis:



A statistical power analysis suggested that sample sizes of 15 subjects per group were required to achieve more than 80% power. Data were first analyzed using the Kolmogorov-Smirnov test to recognize a normal distribution. The differences between the beginning and post treatment measurements were analyzed using the paired Student t test. The differences between the three groups were analyzed using one-way analysis of variance (ANOVA) followed by least square difference (LSD) post hoc test. Level of significance for all tests was set at (0.05). Statistical tests were performed using SPSS version 17.

### 3. RESULTS

There was no significant difference between participants in the three groups in their Physical characteristics at the beginning of the study as shown in table (1).

**Table 1. Physical characteristics of the subjects at the beginning of the study.**

Characteristics	Group (A)	Group (B)	Group (C)	Significant (P-value)
Age(year)	34.26±4.52	34.13±5.89	35.33±4.7	0.77
Weight(kg)	79.66±2.76	79.73±3.69	79.2±4.07	0.9
Height (Cm)	167.06±3.21	167.26±5.92	167.8±4.9	0.91
BMI(kg/m <sup>2</sup> )	28.54± 0.57	28.51±0.94	28.12±0.62	0.22

Data presented as mean± standard deviation; p >0.05 (No significant).

#### Effect of U.S cavitation radiofrequency and diet (Group A):

The Body weight significantly decrease post U.S cavitation, radiofrequency and diet with a percentage of 7.36% (Pre: 79.66±2.76; post: 73.8±3.0; p < 0.0001). BMI showed also significant reduction with a percentage of 7.35% (Pre: 28.54±0.57; post: 26.44±0.81; p < 0.0001). In addition, there was a significant reduction of waist circumference with a percentage of 8.6 % (Pre: 92.93±3.55; post: 84.93±3.67; p < 0.0001). While there was no significant reduction of hip circumference with a percentage 0.12% (Pre: 106.66±3.24; post: 106.53±3.22; p >0.05). Furthermore, there was a significant reduction of waist hip ratio with a percentage of 8.04% (Pre: 0.87±0.01; post: 0.79±0.02; p < 0.0001) Finally, there was a significant reduction of Suprailiac skin folds with a percentage of 20.31% (Pre: 25.74±0.98; post : 20.51±1.39; p < 0.0001) as shown in table (2) fig (1,2,3,4).

#### Effect of mesotherapy and diet (Group B):

There was significant decrease in Body weight post mesotherapy and diet with a percentage of 6.52% (Pre: 79.73±3.69; post 74.53±3.31; p < 0.0001). Also, BMI showed significant decrease with a percentage of 6.48% (Pre: 28.51±0.94; post: 26.66±0.92; p < 0.0001). Furthermore, waist circumference showed significant reduction with a percentage of 6.41% (Pre: 93.53±3.2; post: 87.53±2.72; p < 0.0001). While there was no significant reduction of hip circumference with a percentage 0.06% (Pre: 107.93±2.89; post: 107.86±2.85; p >0.05). In addition, there was a significant reduction of waist hip ratio with a percentage of 6.39% (Pre: 0.86±0.01; post: 0.81±0.01; p < 0.0001). Finally, Suprailiac skin folds significantly reduced with a percentage of 12.38% (Pre: 25.96±1.02; post 22.63±1.43; p < 0.0001) as shown in table (2) fig (1, 2, 3, 4).

#### Effect of diet (Group C):

The Body weight significantly decrease post diet with a percentage of 4.12% (Pre: 79.2±4.07; post: 75.93±3.71; p < 0.0001). BMI showed significant reduction with a percentage of 4.08% (Pre: 28.12±0.62; post: 26.96±0.63; p < 0.0001). In addition, waist circumference reduced significant with a percentage of 2.93% (Pre: 93.06±2.6; post: 90.33±2.66; p < 0.0001). While there was no significant reduction of hip circumference with a percentage 0.06% (Pre: 107.26±2.21; post: 107.2±2.14; p >0.05). Furthermore, there was a significant reduction of waist hip ratio with a percentage of 2.79% (Pre: 0.86±0.01; post: 0.84±0.01; p < 0.0001). Finally, there was a significant reduction of Suprailiac skin folds with a percentage of 6.6% (Pre: 26.2±1.2; post: 24.46±1.42; p < 0.0001) as shown in table (2) fig (1, 2, 3, 4).

**Table 2.** Body weight, BMI, Waist circumference, hip circumference, Waist hip ratio, Suprailiac skin folds pre and post treatment in each group

Variables		Group (A) (mean±SD)	Significant (P-value)	Group (B) (mean±SD)	Significant (P-value)	Group (C) (mean±SD)	Significant (P-value)
Body Weight	Pre	79.66±2.76	0.0001*	79.73±3.69	0.0001*	79.2±4.07	0.0001*
	Post	73.8±3.0		74.53±3.31		75.93±3.71	
BMI	Pre	28.54±0.57	0.0001*	28.51±0.94	0.0001*	28.12±0.62	0.0001*
	Post	26.44±0.81		26.66±0.92		26.96±0.63	
Waist circumference	Pre	92.93±3.55	0.0001*	93.53±3.2	0.0001*	93.06±2.6	0.0001*
	Post	84.93±3.67		87.53±2.72		90.33±2.66	
HIP circumference	Pre	106.66±3.24	0.16	107.93±2.89	0.33	107.26±2.21	0.33
	Post	106.53±3.22		107.86±2.85		107.2±2.14	
Waist hip ratio	Pre	0.87±0.01	0.0001*	0.86±0.01	0.0001*	0.86±0.01	0.0001*
	Post	0.79±0.02		0.81±0.01		0.84±0.01	
Suprailiac Skin folds	Pre	25.74±0.98	0.0001*	25.96±1.02	0.0001*	26.2±1.2	0.0001*
	Post	20.51±1.39		22.63±1.43		24.46±1.42	

Data presented as mean± standard deviation; \*p <0.05(significant).

**Comparison among the three groups pretreatment:** At baseline (pretreatment), all parameters were not different among the participants in the examined groups as revealed by ANOVA test table (3)

**Table 3.** comparison between the three groups in body weight, BMI, Waist circumference, Hip circumference, Waist Hip Ratio, Suprailiac Skin folds pretreatment.

Variables	Group (A)	Group (B)	Group (C)	P-value
Body Weight	79.66±2.76	79.73±3.69	79.2±4.07	0.9
BMI	28.54±0.57	28.51±0.94	28.12±0.62	0.22
Waist circumference	92.93±3.55	93.53±3.2	93.06±2.6	0.86
Hip circumference	106.66±3.24	107.93±2.89	107.26±2.21	0.47
Waist Hip Ratio	0.87±0.01	0.86±0.01	0.86±0.01	0.61
Suprailiac Skin folds	25.74±0.98	25.96±1.02	26.2±1.2	0.52

Data presented as mean± standard deviation; p >0.05 (No significant).

**Comparison among the three groups post treatment:**

Post treatment, there were no significant difference among the three groups in body weight (P=0.22), BMI (P=0.2), and waist circumference (P=0.42). While there were significant difference among the three groups in waist circumference (P=0.0001), waist hip ratio (P=0.0001), and Suprailiac Skin folds (P=0.0001) as revealed by ANOVA test. For waist circumference, group (A) showed better reduction than group (B) and group (C) as (P=0.02) and (P=0.0001) respectively as revealed by post hoc test. While group (B) showed better reduction in waist circumference than group (C) (P=0.01). Also, for waist hip ratio group (A) showed better reduction than group (B) and group (C) as (P=0.03) and (P=0.0001) respectively. While group (B) showed better reduction in waist hip ratio than group (C) (P=0.0001).

Concerning Suprailiac Skin folds group (A) showed better reduction than group (B) and group (C) as (P=0.0001) and (P=0.0001) respectively. While group (B) showed better reduction in waist hip ratio than group (C) (P=0.001).

**Table 4.** comparison between the three groups in body weight, BMI, Waist circumference, Hip circumference, Waist Hip Ratio, Suprailiac Skin folds post treatment.

Variables	Group (A)	Group (B)	Group (C)	P-value
Body Weight	73.8±3.0	74.53±3.31	75.93±3.71	0.22
BMI	26.44±0.81	26.66±0.92	26.96±0.63	0.2
Waist circumference	84.93±3.67	87.53±2.72	90.33±2.66	0.0001*
Hip circumference	106.53±3.22	107.86±2.85	107.2±2.14	0.42
Waist Hip Ratio	0.79±0.02	0.81±0.01	0.84±0.01	0.0001*
Suprailiac Skin folds	20.51±1.39	22.63±1.43	24.46±1.42	0.0001*

Data presented as mean± standard deviation; \*p <0.05(significant).

#### 4. DISCUSSION

Our findings demonstrate that there were no significant difference among the three groups in body weight, BMI, and hip circumference post treatment. While for waist circumference, waist hip ratio, and Skin folds at umbilical level U.S cavitation radiofrequency and mesotherapy groups showed better improvement than control (diet) group at the end of study. Furthermore the participants in U.S cavitation radiofrequency group showed better reduction in waist circumference, waist hip ratio, and Skin folds at suprailiac level at the end of treatment than mesotherapy group.

Regarding the results of ultrasound cavitation radiofrequency group our findings had an agreement with Coleman et al. Who reported a favorable effect of Cavitation in reduction of localized fat Moreover, these results persist because the accumulation of fat in the treated field is terminated. Cavitation is not only used for reduction of localized fat, but also to effectively fight cellulite: fibrous tissue (orange peel) is destroyed, and not just "squeezed out" as in other procedures. (16)

In addition, Moreno-Moraga et al. investigated the effect of U.S cavitation on 30 healthy patients who underwent three treatments, at 1-month intervals by U.S cavitation, and were followed for 1 month after the last treatment. All patients showed significant reduction in subcutaneous fat thickness within the treated area. The mean reduction in fat thickness after three treatments was 2.28±/0.80 cm. Circumference was reduced by a mean of 3.95±/1.99 cm. (17)

Also it come in agreement with Nazanin S. et al. Who reported that High intensity focused ultrasound is a new promising method for fat reduction. HIFU works by ablating subcutaneous adipose tissue and causing molecular vibrations that increase the temperature of local tissue and induce rapid cell necrosis. Several studies reveal the safety and efficacy of HIFU for fat reduction in the abdomen and the flanks. These studies indicate consistent reduction in abdominal circumference >2 cm after a single treatment. The adverse events are limited to transient tenderness, bruising, and edema. As a result, the likelihood of using HIFU for fat reduction will increase over time.(10)

In the present study our choice to use Ultrashpe cavitation device based on its mechanical acoustic effects of UltraShape because selective fat cell disruption without injury to skin, vessels, nerves, or connective tissue. After disruption of the fat cells, the contents, primarily triglycerides, are dispersed into interstitial space and then transported through the vascular lymphatic system to the liver.

These triglycerides are theoretically absorbed slowly and then metabolized by endogenous lipases to glycerol and free fatty acids. The fatty acids are transported to the liver where they are processed like any other fatty acids. UN metabolized triglycerides are bound to carrier proteins, or lipoprotein complexes, to become part of the total lipoprotein pool. To date, there have been no abnormal changes in serum lipids detected in clinical studies of Ultrashape (6,17)

The present study come in agreement with Brightman L et al. Who reported that the combination of infrared light (IR), bipolar radiofrequency (RF), vacuum and mechanical massage has demonstrated efficacy in improving arm circumference, at the 5th treatment it was statistically significant with a mean loss of 0.625 cm. At 1- and 3-month follow-ups, mean loss was 0.71 and 0.597 cm respectively. Reduction of abdominal circumference at 3rd treatment was statistically significant with a 1.25 cm mean loss. At 1- and 3-month follow-ups, average loss was 1.43 and 1.82 cm respectively. They concluded that sustainable reduction in circumference and improvement in appearance of arms and abdomen following treatment.(18)

In the present study selection of Radiofrequency (RF) came in agreement with Romero et al who stated that using combines of bipolar radio frequency (RF) and intense infrared light (IR) together with mechanical massage and suction has recently been reported as being efficient for reduction of adipose tissue Ten patients were enrolled for 12 sessions of 30 minutes each performed over one buttock, the other buttock serving as an untreated control. Sessions were conducted twice a week for a period of 12 weeks. Clinical photography and profilometry were carried out to assess textural changes before (baseline) and 2 months after the final treatment. Histopathology was performed at baseline, 2 hours after the first session, and just before the 12th session and 2 months thereafter. All patients noted improvement in the treated buttock before the final session, which was maintained at the 2-month assessment. Improved skin appearance and reduction of adipose tissue was noticed after the first session and was maintained throughout the study. All patients were satisfied with the results and requested further treatment in order to balance the results in both buttocks. They concluded that treatment sessions with the combined RF, IR light and mechanical massage and suction system were complication free, produced improvements in the treated area appearance and skin condition. (19)

Furthermore Maurice A et al. stated that the combination of bipolar RF, IR light, and mechanical tissue manipulation with pulsed vacuum and massage rollers appears to be a safe and effective therapeutic modality for the reduction of adipose tissue volume and skin tightening. It is suggested that using higher bipolar RF energy may also result in a more intense heating of the targeted tissues, resulting in both faster treatment times as well as improved clinical outcomes.(20)

In the present study applying the bipolar RF energy to the hypodermis increases fat cells' metabolism and accelerated triglyceride egress from the cell. Increased tissue temperature increases vascular perfusion, which further enhances lipid turnover owing to increased oxygen content. Increased lipid turnover results in fat cell shrinkage and reduced fat tissue volume, a circumferential reduction, and an esthetic reduction in the convex distension.(21)

Concerning the results of mesotherapy group the results of our study come in agreement with Rotunda et al. Who stated that Fat Reduction/Weight Loss with mesotherapy usually need from 2 to 4 treatments (injections) required at intervals of 2 to 4 weeks. Depending on the problem area, the number of procedures could increase. Because mesotherapy treatments for weight loss do not produce drastic changes, it is generally recommended for patients who require a little fat reduction in specific areas, as with body contouring.(13)

Injection of Phosphatidylcholine and Deoxycholate did not produce anticipated aesthetic results. This narrative does not imply that under different circumstances, PC-DC will not work. In fact, Kythera Biopharmaceuticals, Inc (Calabasas, California) has produced a first-in-class injectable drug that has undergone 4 successful clinical studies: 2 randomized, double-blind, placebo-controlled, Phase 2 studies using the injectable drug in the reduction of submental fat and 2 Phase 1 pharmacokinetic and histology studies.(22) The company reports that the injectable is safe and shows efficacy in reducing localized fat deposits.(23)

The present study selecting Phosphatidylcholine and Deoxycholate (PC-DC) Mesotherapy injections effectively reduce abdominal fat volume and thickness by inducing adipocyte necrosis. These treatments do not appear to increase circulating markers of inflammation or affect glucose and lipid metabolism. The ideal candidate for injection lipolysis desires treatment of small areas of excess fat or localized deposits, such as the correction of postlipoplasty contour irregularities or asymmetry. Injection lipolysis is a tool for those patients who wish to have less invasive procedures and/or are afraid of anesthesia. However, patients need to be aware that achieving desired results may take several months. (24)

## 5. CONCLUSION

From the obtained results it may be concluded that U.S cavitation with radiofrequency has a favorable effect than mesotherapy in reduction of waist circumference, waist hip ratio, and Skin folds at Suprailiac level.

### Competing interests:

We did not received any financial support from any institution or company it is our project and we insured all expenses. No competing interests

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### Author contribution:

We are three authors for this work and we did all requirement to accomplish this work, there is no other researchers participate in this work.

## 6. REFERENCES

1. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, McQueen M, Budaj A, Pais P, Varigos J, Lisheng L, INTERHEART Study Investigators. (2004). "Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study". *Lancet* 364 (9438): 937–52.
2. Carey D.G.P. (1998). Abdominal Obesity. *Current Opinion in Lipidology*. (pp. 35-40). Vol. 9, No 1. Retrieved on April 9, 2012.
3. Razay and George "Obesity, Abdominal Obesity and Alzheimer's Disease", *Dementia & Genetic Cognitive Disorders*, July 2006.
4. Ter haar G and Coussios C .High intensity focused ultrasound: physical principles and devices. *Int J Hyperthermia*. 2007;23:89\_104.
5. Mark Jewell .High-Intensity-Focused Ultrasound: Changing the Face of Body Sculpting *JOURNAL OF CLINICAL DERMATOLOGY*. *DERMA* 2010; 1:(2). December 2010.
6. Brown SA, Greenbaum L, Shtukmaster S, et al: Characterization of nonthermal focused ultrasound for noninvasive selective fat cell disruption (lysis): Technical and preclinical assessment. *Plast Reconstr Surg* 124:92-101, 2009.
7. Lundberg GD. Fat reduction by topical waist applications may actually work. *Medscape J Med*. 2008;10:43.
8. 8- McCarthy HD, Cole TJ, Fry T, Jebb SA, Prentice AM. Body fat reference curves for children. *Int J Obes (Lond)*. 2006;30 :598 –602.
9. Thatcher and Samuel. *PCOS: The Hidden Epidemic*. Perspectives Press; Indianapolis. 2000.
10. Nazanin Saedi, MD, and Michael Kaminer, MD. *Seminars in cutaneous medicine and surgery New Waves for Fat Reduction: High-Intensity Focused Ultrasound*. 2013.
11. Brightman L1, Weiss E, Chapas AM, Karen J, Hale E, Bernstein L, Geronemus RG . Improvement in arm and post-partum abdominal and flank subcutaneous fat deposits and skin laxity using a bipolar radiofrequency, infrared, vacuum and mechanical massage device. *Lasers Surg Med*. 2009 Dec;41(10):791-8.
12. Bryant R. Controversial mesotherapy: Could it be the next botox? *Dermatology Times*; December 1, 2004.
13. Rotunda AM, Suzuki H, Moy RL, Kolodney MS. Detergent effects of sodium deoxycholate are a major feature of an injectable phosphatidylcholine formulation used for localized fat dissolution. *Dermatol Surg* 2004;30:1001-8
14. Robert P and Pitera, MD Can Mesotherapy Be Used to Treat Obese Patients successfully *American Journal of Mesotherapy science section* .volume 2.2009
15. Robert Ross, PhD; Damon Dagnone, MSc; Peter J.H. Jones, PhD; Heidi Smith, BSc, RD; Anne Paddags, MSc; Robert Hudson, MD, PhD; and Ian Janssen, MSc Reduction in Obesity and Insulin Resistance with Diet or Exercise 18 July 2000 *Annals of Internal Medicine* Volume 133 • Number 2
16. Coleman KM, Coleman WP 3rd, Benchetrit A. Non-invasive, external ultrasonic lipolysis. *Semin Cutan Med Surg*. 2009;28(4):263-267.
17. Moreno-Moraga J, Valero-Altés T, Riquelme AM, Isarria Marcossy MI and de la Torre JR. Body contouring by non-invasive transdermal focused ultrasound. *Instituto Médico Lasers Surg Med*. 2007; 39(4):315-23.
18. Brightman L1, Weiss E, Chapas AM, Karen J, Hale E, Bernstein L, Geronemus RG. Improvement in arm and post-partum abdominal and flank subcutaneous fat deposits and skin laxity using a bipolar radiofrequency, infrared, vacuum and mechanical massage device. *Lasers Surg Med*. 2009 Dec;41(10):791-8.
19. Romero C1, Caballero N, Herrero M, Ruíz R, Sadick NS, Trelles MA Effects of cellulite treatment with RF, IR light, mechanical massage and suction treating one buttock with the contralateral as a control. *J Cosmet Laser Ther*. 2008 Dec;10(4):193-201.
20. Maurice A. Adatto, Robyn M. Adatto-Neilson, and Grietje Morren .Reduction in adipose tissue volume using a new high-power radiofrequency technology combined with infrared light and mechanical manipulation for body contouring *Lasers Med Sci*. 2014; 29(5): 1627–1631.
21. Stephen R. Mulholland, MD, FRCS(C) a Malcolm D. Paul, MD b, Charbel Chalfoun, MD c Noninvasive Body Contouring with Radiofrequency, Ultrasound, Cryolipolysis, and Low - Level Laser Therapy *Clin Plastic Surg* 38 (2011) 503–520
22. Kythera Biopharmaceuticals, Inc KYTHERA Biopharmaceuticals announces results from open label study for [http://www.kytherabiopharma.com/newsroom/article/Open-Label\(2012\)](http://www.kytherabiopharma.com/newsroom/article/Open-Label(2012))
23. Spencer A and Brown, PhD .Commentary on: Metabolic and Structural Effects of Phosphatidylcholine and Deoxycholate Injections on Subcutaneous Fat .A Randomized, Controlled Trial *Aesthet Surg J*. Mar 2013; 33(3): 411–413.
24. Dominic N. Reeds, MD, B. Selma Mohammed, MD, PhD, Samuel Klein, MD, Craig Brian Boswell, MD, FACS, and V. Leroy Young, MD, FACS . Metabolic and Structural Effects of Phosphatidylcholine and Deoxycholate Injections on Subcutaneous Fat A Randomized, Controlled Trial. *Aesthet Surg J*. Mar 2013; 33(3): 400–408.

## 7. APPENDAGES



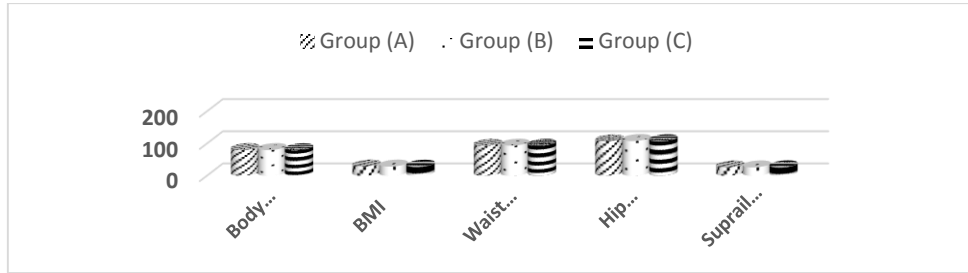


Fig (1): body weight, BMI, Waist circumference, Hip circumference, Suprailiac Skin folds pretreatment.

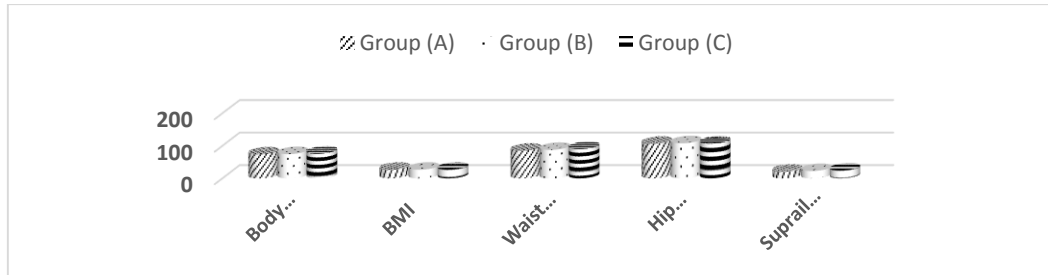


Fig (2): body weight, BMI, Waist circumference, Hip circumference, Suprailiac Skin folds post treatment.

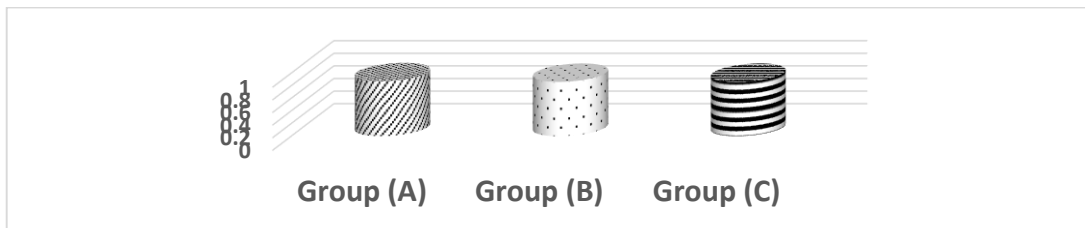


Fig (3): Waist hip ratio pre treatment for the three groups.

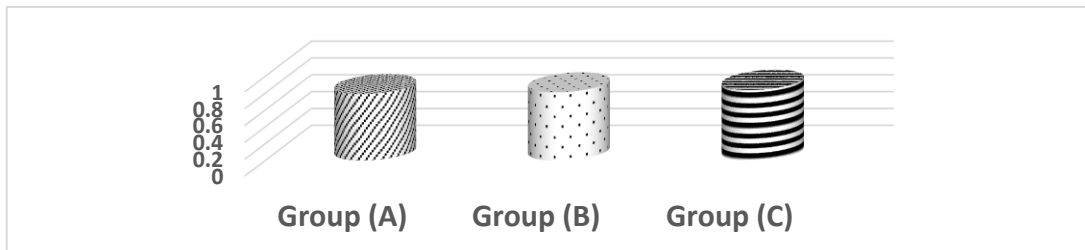


Fig (4): Waist hip ratio post treatment for the three groups.

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# CREATIVE QUALITIES AND THEIR RELATIONSHIP TO ACCURATELY PERFORM SOME OF THE BASIC SKILLS OF VOLLEY BALL FOR THE STUDENTS OF THE COLLEGE OF PHYSICAL EDUCATION, UNIVERSITY OF KARBALA

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## Abstract

There is no doubt that every skill of basic skills in volleyball requires a certain kind of creative qualities and by observing researcher for volleyball games and with a continuous basis, both within the college or outside. I have noticed that there is a decline in the creative qualities and the level of performance of the basic skills in volleyball and considering that the Volleyball focus the attention of many of her fans as a practice, a study and as a scientific research only. All those things turned to the importance of the study of the creative qualities because it forms a significant part and an indication of the level of performance of the basic skills in volleyball, and Research Goals Building the creative qualities scale at the college of physical education students at the University of Karbala the research community included the students of the Faculty of Physical Education at the University of Karbala for the fourth stage's which is consists of (99) students when a sample of random manner was selected with (40) student and a percentage of (40.40%).

1. The results showed that there are real differences between the students of the Faculty of Physical Education in the fact of the creative qualities dimensions.
  2. The results showed a high level of accuracy for both transmission and receiving skills of volley ball with students of the Faculty of Physical Education.
  3. The existence of a positive correlation between each of the creative qualities and accuracy performance skills of transmission and receiving transmission to the students of the College of Physical Education relationship.
- KEYWORDS: Creative. Volleyball. Physical Education.**

## 1. INTRODUCTION

The creativity is considered a human character characterized by humanity from ancient times as the creations of many adults' scientists and philosophers and artists were not a natural consequence of learning but serious creativity which a group of individuals is marked by to other people. Creativity takes many forms such as mental creativity which is reflected in the form of ideas or theories or artistic product or music or story or a creative poem ... And There are scientific creativity which is presented in quantitative forms as the athlete expansion or to reach a new formula or a new record in a particular game and qualitative creativity that represented in a new application or a responsible administration of an organization. There is another form of creativity combines form of mental and practical, which is combining theory and practice.

Hence the importance of the research with studying and know the creative process of the individual and how to strengthen it and the ability to generate new ideas in order to compete in various aspects of life as that creativity depends on knowledge and high skill and creativity doesn't restrict to field without the other, or individual without the other, but creativity is grows and strengthened under the terms and characteristics which must be provided to the person as the choice of the appropriate curriculum and the way in which they can reach to achieve the goals and the applying of assumptions is one of the concerns of scientists and researchers towards understanding and grasping the ways to create innovation and thus access to the circle of integration between reality and ambition as the individual's ability to be creative in sports practicing can configure an ideal template from which he can give and contribute to the community as the sports practice works to increase production and improve fitness, health, and improve the welfare of the members of the society.

**Research problem:** There is no doubt that every skill of basic skills in volleyball requires a certain kind of creative qualities and by observing researcher for volleyball games and with a continuous basis, both within the college or outside. I have noticed that there is a decline in the creative qualities and the level of performance of the basic skills in volleyball and considering that the Volleyball focus the attention of many of her fans as a practice, a study and as a scientific research only. All those things turned to the importance of the study of the creative qualities because it forms a significant part and an indication of the level of performance of the basic skills in volleyball.

And in believing of the researcher of the scientific research and means and ways if she turned to the study of the relationship between the creative qualities and the level of performance of the basic skills to set data to be an indicator for teachers and trainers in order to use it to develop the skill level of performance of those skills

#### Research Aim:

1. Building the creative qualities scale at the college of physical education students at the University of Karbala
2. To identify the nature of the relationship between the creative qualities and accuracy performance of some basic skills of volleyball

## 2. MATERIAL AND METHODS

The researcher used descriptive survey manner and mutual relations to achieve the objectives of the study.

**Society and the research sample:** -the research community included the students of the Faculty of Physical Education at the University of Karbala for the fourth stage's which is consists of (99) students when a sample of random manner was selected with (40) student and a percentage of (40.40%)

**] Identify variables:** -Creative qualities scale (Mohammad Hassan Allawi: 1998.47)

For the purpose of identifying the creative qualities to the students of the Faculty of Physical Education, the researcher collects sources and scientific references and the creative qualities scale which is prepared by Mohammed Hassan Allawi and consists of three dimensions depends on linking to the creative qualities for the player sports, especially in connection with the dimensions of the three special qualities of creativity which are as follows: -

- 1- Mental qualities
- 2- Psychological qualities
- 3- Practical qualities

The test consists of (33) phrase and three dimensions include (13) paragraph of the first dimension of mental qualities, and paragraph (11) of the second dimension of psychological qualities and (9) paragraph of the third dimension represented by the practical qualities, all dimensions scores are gathered separately and grades which are near grade (39) refers to distinguish the player for the first dimension (mental qualities, and the grade (33) refers to distinguish the player for the second dimension (psychological qualities, and 27 points to characterize the player for the third dimension (practical characteristics, as well as collecting the total score of the player and of the three dimensions to get a higher degree obtained in the scale as a whole.

Then, the researcher presented the scale on a group of experts and specialists to indicate the validity of the paragraphs of the scale of Creative qualities measurement of the students and the percentage of experts' approval was abstract.

**Identifying the skills of research and its tests:**The two skills of transmission from below and receiving transmission are chosen (passing down from bottom) depending on the educational course for the students of the fourth stage at the college, as they are among the basic skills involved in the standard curriculum of this school stage in college and they are of the important skills that must be learned by the student in the early stages of the study.

**Identifying tests:** -The two skills of transmission from below and receiving transmission (passing down from bottom) are adopted and they are standardized and used tests in previous researches, and on the same research sample specifications.

**Exploratory Experiment :** Exploratory experiment was conducted and a questionnaire of the scale of creative qualities and applying the test of skills of transmission from below and receiving transmission was distributed on Monday, 10/12/2013 about the research exploratory sample which consists of 5 students from within the sample of the basic research, in order to identify the most important difficulties and obstacles that may face the researcher while conducting the main experiment and was then re-test the same on Tuesday, 12.17.2013 on the same exploratory experiment sample and under the same circumstances the same results came after the extraction of the coefficients of validity and reliability whose values were (0.83) and (0.78) respectively.

**Tests Scientific Transactions:** - validity of tests: - to check the validity of the tests, the researcher used the content validity by offering tests on a group of experts and specialists (seen Appendix 1) and the (12) expert and a specialist, and after collecting the forms and sort the results, the results showed that the rate of experts and specialists approval on the appropriate tests which are put for is (100%), reaching a value of (Ca 2) calculated (), and it is larger than of its Tabulated value which is (3.84) when the degree of freedom (4) and at the designation level of (0.05) which shows the abstract choice and in favor of conformists (fit), and this is what shows the validity of these tests, as shown in table (2).

3-6-2 stability of tests: - the researcher find the stability of tests by applying the tests on 12/10/2013 and then re-applied on the exploratory sample individuals members with a time lag (7) days, ie on 17.12.2013, and the results indicated that tests under researching have high varying stability degrees, as shown in table (2).

3- 6-3tests objectivity: - The most used tests in the researches are easy and clear to understand and is unable to be interpreted and is far from self-evaluation of the rectifier, but the researcher has created an objectivity of tests of the technical performance of the

transmitting of the lower and receive transmissions volley ball through grades of two rectifiers, and the researcher used simple correlation factors grades, and was the value of the correlation factor is high, as it has a high degree of objectivity, as shown in table (1).

**Table 1: shows the scientific transactions for the tests of skills in volleyball under research**

S	Statistical parameters of Tests	Validity factor		Reliability factor	Objectivity factor
		fits	Doesn't fit		
1	Technical performance to send from the bottom	5	Zero	0.87	0.89
2	Transmission from the bottom accuracy	5	Zero	0.91	--
3	Technical performance of the transmitter receiver	5	zero	0.86	0.85
4	Transmission reception accuracy			-	0.89

### 3. RESULTS AND DISCUSSION

**Display and analysis and discussion of the reality of the creative qualities and accuracy of performance of some basic skills in volleyball**

**Display, analyze and discuss the results of the reality of the creative qualities of students of the Faculty of Physical Education**

To achieve the goal of the first study, the researcher seeks to extract the Arithmetic mean values and standard deviations, standard error of the dimensions of the creative qualities of students of the Faculty of Physical Education at the University of Karbala in order to recognize the reality of the creative qualities to the research sample individuals and thereby achieve the first objective of the study (Table 2) shows that.

**Table 2 shows the Arithmetic mean values and standard deviations, standard error of the dimensions of the creative qualities of the research sample**

Creative quality dimensions	The sample volume	The Arithmetic mean	standard deviations	standard error
Mental qualities	40	6.33	2.56	0.31
Psychological qualities	40	2.44	1.16	0.14
Practical qualities	40	7.12	2.48	0.30

Through table (2) results show that there is deference in the reality of creative qualities among the students of the Faculty of Physical Education through the deference of the values of the arithmetical means and the deviations of the dimensions of creative qualities, for example we found that after attributing winning to control center the arithmetical mean's value reached (6.33) and standard deviation (3.21) and it's a high value, and this is due to the internal factors and its explanation through more effort and perseverance and the ability to achieve success. Both of challenge and skill can be developed gradually in stages, which can be identified clearly, the more increased the athletic skill in the various dimensions of the skill, the challenge difficulty decreased and the better of athletic performance level increased, the more challenge aspects to accomplish the goal are found as it happens from the athletic at the beginning of the competition, where he would be more eager than necessary to achieve the goals, also the athletic would be a little nervous. The eager would be because of the good preparation and when nervous is found this means that the competition means a lot to the athletic, and when the goal of the athletic related to the best performance, he thought that he face the challenge. But because of the situation difficulty, he needs all his efforts as well as the full awareness of the goals set, as he has to pay attention and overcome the anxiety and face all the challenges in a fast and compatible form, when we find that after attributing losing the arithmetical mean's value reached (2.44) and standard deviation (1.16) and it's a low value compared with the previous dimension. And it's a signal of the excellence of the research sample with the control of the internal factors more than the external factors. That means that the attribution of losing may base on external factors more than internal ones, and for the dimension of attributing the good performance it achieved arithmetical mean and standard deviation valued (7.12) and (2.48) straight, and it's an evidence of the internal control of the players and the possibility of their control of behavior on one hand and on the other hand, possessing positive understanding of themselves. Regarding the attribution of the bad performance it achieved arithmetical mean (3.21) and standard deviation valued (1.30) which refers to that the research sample attribute the reasons of the weak performance to the external factors such as luck or the mission difficulty, and it's hard to control it.

**Display, analyze and discuss the accuracy results of performance of the transmitter and receiver skills for students of the Faculty of Physical Education:**

To achieve the second aim of the study the researcher sought to extract the arithmetical means and the standard deviations, and standard error values of the skills of the transmitter and receiver of the volleyball for students of Faculty of Physical Education at



the University of Karbala to identify the performance accuracy of transmitter and receiver skills among the research sample individuals and that achieved the second aim of the study (Table 3) shows that.

**Table 3 shows the Arithmetic mean values and standard deviations, standard error for accurate performance of the skills of transmission and reception of the research sample**

Tests	The sample volume	M	S.D	standard error
Technical performance to send from the bottom	68	5.35	1.37	0.16
Transmission from the bottom accuracy	68	16.67	2.74	0.33
Technical performance of the transmitter receiver	68	6.22	1.68	0.20
Transmission reception accuracy	68	18.43	3.11	0.37

Through a table (4) The results showed that the highest value of arithmetical means has achieved in accuracy performance of the skill of transmitter receiver accuracy which reached (18.43) and a standard deviation (3.11), that indicate the players ability of skilled performance and implementation of kinetic duty well, this besides perseverance, desire, the determination, and the challenge for achieve the goals while the performance accuracy of the transmitter skill has achieved arithmetical mean of (16.67) and a standard deviation (2.74), which shows that players have a good level of skilled performance and internal control of player by behavior adjusting and lack of affection by the external factors related to various course of performance.

The nature of the relationship between the reality of the creative qualities and performance accuracy of the skills of the transmitter and receiver volleyball to the research sample.

After extracting arithmetical means and standard deviations values for each of the creative qualities variable and performance accuracy of the skills of the transmitter and receiver transmitter with volleyball to the research sample variable, the researcher identify the nature of the correlation between variables through simple correlation coefficient (Pearson) and this what made the third aim of the research achieved as shown in table (4).

**Table 4: shows the nature of the correlation (Pearson) between research variables of the sample individuals**

Variables	Transmission accuracy	Transmission receiving accuracy
Mental qualities	0.43	0.36
Psychological qualities	0.30	0.45
Practical qualities	0.38	0.46

\*Moral Correlation because it is bigger than the tabular value of (0.21) at significance level of (0.05) and the liberty degree of (66).

Through Table (4) showed that there is a positive correlation between the dimension of attributing win and the transmitter accuracy and the reception accuracy skills, as the results showed that the correlation coefficient has reached (0.43) (0.36), respectively, when the liberty degree is (66) and the level of statistical significance (0.05), and it's larger than the tabular value of correlation coefficient of (0.21), which indicates the presence of their correlation, also there is an inverse correlation between the dimension of attributing lose and the transmitter accuracy and the reception accuracy skills, as the results showed that the correlation coefficient has reached (-0.14) (-0.11) respectively, when the liberty degree is (66) and the level of statistical significance (0.05) which is smaller than the tabular value of the correlation coefficient of (0.21) which indicates the absence of their correlation, and the results showed that there is a positive correlation between the dimension of attributing the good performance and the transmitter accuracy and the reception accuracy skills, as the results showed that the correlation coefficient has reached (0.38) (0.46), respectively, when the liberty degree is (66) and the level of statistical significance (0.05), and it's larger than the tabular value of correlation coefficient of (0.21), which indicates the presence of their correlation, also the results showed an inverse correlation between the dimension of attributing of bad performance and the accuracy of transmitter and reception skills, as the results showed that the correlation coefficient has reached (-0.23) (-0.45) respectively, when the liberty degree is (66) and the level of statistical significance (0.05) which is smaller than the tabular value of the correlation coefficient of (0.21).

#### 4. CONCLUSION

1. The results showed that there are real differences between the students of the Faculty of Physical Education in the fact of the creative qualities dimensions.
2. The results showed a high level of accuracy for both transmission and receiving skills of volley ball with students of the Faculty of Physical Education.
3. . The existence of a positive correlation between each of the creative qualities and accuracy performance skills of transmission and receiving transmission to the students of the Faculty of Physical Education relationship.
4. The existence of a positive correlation between both after mental qualities and accuracy performance skills of transmission and receiving volley ball with students of the Faculty of Physical Education relationship.
5. The existence of a positive correlation between both after psychological qualities and accuracy performance of the skills of preparation and reception of the volley ball with students of the Faculty of Physical Education relationship.
6. The presence of a positive correlation between all of the practical qualities dimensions and the accuracy performance of the skills of preparation and reception of the volley ball with students of the Faculty of Physical Education relationship.

## 5. REFERENCES

1. Ibrahim Mahmud. Individual differences in mental abilities, Tripoli: Libyan University Publications, 1973.
2. Ibrahim al-Kanani (and others) . General Psychology, press 8, Safadi Baghdad Press.
3. Ahmed Abdel Dayem minister Ali Mustafa Taha. Coach Volleyball guide tests, planning, records, press 1, Cairo, Dar Al Fekr Al Araby Thought 0.1999.
4. Ahmed Ezzat Rajah. psychology assets, press 11, Cairo: Dar knowledge 0.1970 m.
5. Mr. Mohamed Khair Allah and Mamdouh Abdel Moneim . psychological innovation bases, press 1, Kuwait, Al-Falah Library, Publishing and Distribution, 1990
6. Mr. Mohamed Khair Allah and Mamdouh Abdel Moneim .alases psychological innovation, i 1, Kuwait, Al-Falah Library, Publishing and Distribution, 1990
7. Khalil Abdul Rahman Maaytah, Mohammed Abdul Salam. Talent and excellence, Amman: Dar thought for printing and publishing press 2.2004 m.
8. Khalil Rahman and Mohamed Abdel-Salam, talent and excellence, Amman: Dar thought for printing, publishing and distribution, press 2.2004 m.
9. Zaid al-Huwaidi. Creativity (and its importance, the discovery, development, eye: the United Arab Emirates. University Book House. Press 1, 2004 m.
10. Zaid al-Huwaidi: creativity (what it is, discovery, development), Al Ain, United Arab Emirates, University Book House, press 1.2004 m.
11. Sami Mohammed Melhem: Measurement and Evaluation in Education and Psychology, Oman, Dar soft for publication and distribution, printing, press 3.2005.
12. Saleh Muhammad Ali and Muhammad Bakr Nofal. Teaching thinking and theory and practice .eman: Dar march for publication and distribution, press 1.2007 m.
13. Salah Alddin Mohammed Allam Educational Measurement and Evaluation and interpretation of contemporary fundamentals and applications , press 1, Cairo: Dar Al fekr Al Araby .2000 m.
14. Salah Alddin Mohammed Allam Educational Measurement and Evaluation and interpretation of contemporary fundamentals and applications, press 1
15. Fatima Mahmoud Zayat . Creative psychology, Amman, Jordan: Publishing, distribution and printing, press 1.2001 m.
16. Ali Mustafa Taha. Volley ball- history - education - training- analysis, press 1, Egypt, Dar Al fekr Al Araby Thought for printing, publishing and distribution 0.1999.
17. Kadhim Abdel Nour. studying and research in the science of Alnma: Jordan, De Bono for printing, publishing and distribution,press 1.2005 m.
18. Karam Zaki: Encyclopedia of modern volleyball, press 1, Oman Publishing House Department of Physical Education University encyclopedia 0.1999.
19. Majid Bahauddin Mr. Obaid: pressure and emotional problems, and its impact on mental health, i 1, Publishing and Distribution, Oman 0.2008 m.
20. Wajih Mahjoub: methods of scientific research and curriculum, Baghdad, Library Publishing, i 1.1988.
21. Berthold. F. and Bernd. Z.: Selected aspects of the developments of men s volleyball, The Coach, 1996, PP. 14-24.

## 6. APPENDAGES

Appendix (1) The views of the research sample questionnaire (students of the Faculty of Physical Education)

Dear (the student, the student) ..... the respectful.

Greetings:

Please, answer all the paragraphs of the scale and note that there are negative paragraphs and positive phrases, by putting the mark ( ) at is (1) and the highest degree of the alternatives is (3).

S	Phrases	always	sometimes	Seldom
1	I have a high degree of creative thinking and I like renewal			
2	I own a strong memory in some matters relating to the article and is capable of getting to know the details			
3	I prefer to deal with the complex and diverse things that are open to interpretation			
4	I relied on strong note for all tracks and styles of competence that I'd			
5	High ability to summarize the topics of study and focus attention on constructive criticism			
6	I tend to find more than one solution to the problem			
7	Focus on constructive criticism			
8	I have an independent thought			
9	I wander more			

10	Thinking better in periods of calm and leisure			
11	Fast access to reach solutions			
12	I have the ability to link ideas			
13	I have the ability to produce a large number of ideas at one time			
Psychological Qualities				
14	Able to adopt rapidly with variables			
15	I have a degree of emotional balance, ie I do not reacted quickly			
16	Optimistic by nature			
17	I rely on my feelings and my emotions too much			
18	I care for my thoughts and adopt them and be fixed until execute them			
19	I fear not nor retract the problem quickly			
20	I have self-confidence and a sense of the ability to implement what I want			
21	I have high capacity to carry responsibility			
22	A very high ambition			
23	Warned of the negative suggestions			
24	Multi tendencies and interests			
Practical Qualities				
25	I don't prefer doing routine works			
26	I prefer the works which includes challenging			
27	I tend to conspiracy and I like challenging			
28	I am able to deal with ambiguous situations and solving difficult problems			
29	I preserve in my work and follow my ideas even if others oppose me			
30	I am always trying to improve my work			
31	I prefer to work on individual and collective action I think that hard work is the key factor in success			
32	I think that hard work is the key factor in success			
33	I tend to work on my own			

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# EFFECT OF PUBERTAL MATURATION ON THE DEVELOPMENT OF ANAEROBIC POWER IN COLLEGE STUDENTS 11-16 YEARS OF ALGERIA

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## Abstract

The aim of this long study was to examine the pattern of change of boy's anaerobic power during the different stages of puberty.

82 sedentary scholar boys aged from 11 to 16 years agreed to be followed for 2 years, in their schools. We proceed to measure the different anthropometric indicators. Stages of maturation were estimated according to Tanner's classification. The evaluation of the anaerobic process was done through the speed-force's test of Vandewalle. The results show that the majority of morphological indicators of the population developed very significantly from the first to the fourth stage of puberty. The transition from the second to the third stage of puberty seems decisive in the evolution of major morphological and physiological effort parameters. From stage 1 to stage 4 there has been a very significant development ( $p < 0.001$ ) of Anaerobic Maximal Power (Wanmax) and Maximum Force (Fo).

Among boys, the passage from the second to the third stage of puberty seems decisive in the evolution of principles morphological and physiological parameters of the effort.

**Keywords: Puberty stages. Anaerobic power. Scholar boys. Anthropometric indicators.**

## 1. INTRODUCTION

Childhood and adolescence as transitions to adulthood, have a number of important features that play a role in the possibilities of physical and mental effort.

The growth and maturation of speeds differ among children. A variety of factors can influence the growth and maturation as genetic inheritance, nutritional history and overall health. Regarding the effort capacity, it appears that puberty brings substantial changes and distinct physical potential in the same chronological age (GRODJINOVSKYA and BAR-OR, 1984; MURASE, 1981. Aires et al, 2010). In contrast to adults, children and adolescents have the so-called sensitive phases during which the optimal development of the main forms of effort can be made to varying degrees and at different times. Physiologically a pre-pubescent child is characterized by a relatively well developed aerobic metabolism compared to adults. Aerobic maximum opportunities and muscle oxidative enzyme activities deviation (Krebs cycle) are equal and even often superior to those of adults. Instead lactic anaerobic metabolism is commonly regarded as inefficient and immature pre-pubescent ages. The maximum power characterizes the energy sector and its measurement has long been a definite interest in monitoring and improving anaerobic physical skills in different sports. Furthermore anaerobic metabolism of children is relatively little studied; Yet the spontaneous physical activity in children is largely made up of short sprints where anaerobic metabolism is widely sought. Measuring the power of anaerobic metabolism becomes important in children since it is the ideal time to detect young talents and guide them towards explosive sports. The increase in lactic anaerobic power and alactic was found according to age (GRODJINOVSKYA and BAR-OR, 1984; MURASE 1981). Some recent research question this immaturity of anaerobic system during childhood (RATEL and Martin, 2012). The muscle glycolytic enzyme activities are always lower than those of adults. The anaerobic ability, unlike aerobic abilities seems closely related to muscle mass, as well as other factors such as muscle architecture, fiber composition, substrate availability, accumulation of metabolites (lactic acid), metabolic cycles and their activity levels (KEMPER, 1985; Tanner, 1962).

Intense and persistent efforts, with above maximum intensities ( $> VO_{2max}$ ), are frequently encountered in team sports and are mostly made spontaneously by the children. The adaptation and evaluation of workouts or physical education and sport for a better physical performance without harming the health of young practitioners is one of the major concerns of sports educators. To account for the effects of puberty and considering the significant changes that accompany adolescence we studied the maximum anaerobic power based on the five stages of pubertal Tanner staging (1962). These stages take into account the state of maturation of sex organs and development of body hair. The purpose of this study is to assess anaerobic power of Algerian schoolchildren non-athletes during their biological development.

## 2. MATERIAL AND METHODS

Eighty-two (82) sedentary college boys aged 11 to 16 years participated in the study after parental consent. The protocol was carried out within their school.



**Protocol:** Each subject was examined before being allowed to follow the following protocol which was used on three occasions over a period of two years:

. The following anthropometric measurements were taken:

- Assessing the height using a fathom;
- Assessment of body weight using a balance type HB-LO5;
- Measurement of the perimeters of the body (maximum perimeters biceps, thigh, calf) using a tape measure;
- Measurement of four skinfolds (biceps, triceps, subscapular, supra-iliac) with a pair of skin folds (type Harpenden);
- The percentage of fat (% PF) was obtained by the method of four skinfolds in the words of Durnin and Rahaman (1967);
- We calculated lean body mass (LBM) : $(LBM = \text{mass} - \% PF / 100)$ ;

Anthropometric measurements were all carried out on the left side of the body by the same examiner.

. Determination of pubertal stages according to Tanner staging (1962). These indices distinguish five maturation levels characterizing the sexual modifications undergone by the growth path in body:

- Stage 1: existence of pubic fuzz. Testicles, scrotum and penis size even in childhood;
- Stage 2: a few scattered hairs, long, straight or curly at the base of the penis. Increasing the volume of the scrotum and testicles. Volume penis little or no change;
- Stage 3: denser hair, thicker and curlier extending little above the pubic symphysis. Scrotum and testicles as well as increase penis length;
- Stage 4: adult appearance, but the hair region remains less extensive (no extension to the thighs). Penis Enlargement and development of the glans. Testes and scrotum continue to grow. Dark color;
- Stage 5: hairiness has adult appearance location and quantity. Extension of the hair region thighs. Adult genitalia.

. Evaluation anaerobic process by the test Force-speed Vandewalle (1989): for test-load speed, we used a cycle ergometer weight type Monark (894th model, Sweden). This was linked to a computer that calculates micro among other peak power output. The test is performed on a cycle ergometer whose wheel undergoes a braking force caused by tensioning a strap in proportion to the weight hanging on the end. A resistance of 4 kg is imposed on the first attempt and will grow from 2 in 2 for the following efforts up to 12 Kg. The subject makes the sprint 6 seconds maintaining the sitting position. Five events, with a different strength, are performed. The test is stopped when the speed reaches 90 revolutions / min. A passive recovery 3 to 5 minutes is required between levels. Fo values (maximum force), Vo (maximum speed) and Wanmax (Maximum Power), are directly on a graph.

**Statistical analysis:** The results were expressed by their average and standard deviations based on the pubertal classification. We conducted analyzes of variance (ANOVA) to study the evolution of the various parameters at different stages of biological maturation.

### 3. RESULTS

On the morphological parameters as shown in Table 1, we found a very significant change in all indices from first to fourth pubertal stage (S1 to S4) except for percent fat (% PF).

**Table 1: Morphological clues as pubertal stages.**

Pubertal Stages	AGE (an)	Height (cm)	Weight (kg)	Percentage of Fat (% P.F.)	Lean Body Mass (LBM) (kg)
S 1 (n= 13)	12.30	150.46	43.38	10.74	38.42
	± 0,6	± 7,13	± 8,26	± 4,84	± 5,63
S 2 (n= 32)	13.15	155.30	44.36	7.72	40.24
	± 0,7	± 7,32	± 8,13	± 4,63	± 6,35
S 3 (n= 23)	14.04	163.11	52.61	9.8718	46.49
	± 0,8	± 6,91	± 9,19	± 7,84	± 6,80

S 4 (n= 14)	14.99	168.00	56.31	8.72	50.93
	± 0,6	± 5,7	± 6,88	± 2,55	± 5,87

In general it was found (Table 2) from stage 1 to stage 4 there has been a very significant change (p <0.001) Anaerobic Max Power (Wanmax) and the Maximum Strength (Fo). The evolution of the Maximum speed (Vo) was less significant (p <0.05) during the same interval.

**Table 2: The physiological indices according to pubertal stages.**

Pubertal Stages	Wanmax (watts)	Fo (kgf)	Vo (trs/mn)
S 1 (n= 13)	265.97	7.56	173.12
	± 64,03	± 2,28	± 83,35
S 2 (n= 32)	327.02	9.65	147.61
	± 100,55	± 2,41	± 20,35
S 3 (n= 23)	448.61	10.92	172
	± 104,72	± 2,38	± 21,30
S 4 (n= 14)	544.50	14.38	168.51
	± 116,46	± 5,87	± 20,88

The most significant (Table 3) were identified from S2 to S4, especially between stages 2 and 3 for the indices of the Anaerobic Max Power (Wanmax) and Vo (P <0.001), and to a lesser degree Fo (P <0.05).

**Table 3: Evolution of physiological indices for all intervals of pubertal stages.**

Pubertal Stages	S1-S2		S2-S3		S3-S4		S1-S3		S2-S4		S1-S4	
	F	P	F	P	F	P	F	P	F	P	F	P
Wanmax	4.10	*	22.33	***	7.58	**	19.66	***	24.29	***	25.88	***
F0	7.19	**	4.31	*	7.51	**	8.96	***	10.29	***	11.75	***
V0	2.76	ns	20.84	***	0.27	ns	3.65	*	11.71	***	2.92	*

\* P<0.05; \*\* P<0,01; \*\*\* P<0,001; ns : not significant

#### 4. DISCUSSION

The results show that the majority of morphological indices of the study population evolved very significantly from the first to the fourth stage of puberty. These results are similar to those found by various authors (Åstrand 1976; Pineau, 1991. Weltman et al, 1986; ZAUNER, Maksud and MELICHNA 1989). This trend is more significant between stages 2 and 3, which is at the peak of growth often reported by several studies (BUCKLER, 1990; Kemper, 1985; Weltman et al, 1986;. Ortega et al. 2011).

As against this, notes the absence of a significant change in the percentage of fat (% PF) and its relative stability as reported by some researchers (Armstrong et al., 1995; HERTOUGH, MICALLEF and Mercier, 1992). This can be explained by dietary habits in connection with the social conditions that do not favor the emergence of a morphotype with significant fatty layer.

One notes a very significant increase (p <0.001) of the maximal anaerobic power (Wanmax) particularly between stages 2 and 3 as observed in several studies (HERTOUGH, MICALLEF and MERCIER, 1992; Lacour, 1992; Delgado, and ALLEMANDOU PERES, 1992 and 1993; VAN PRAAGH, 2007). As to the maximum force (F0) of the peak increase (p <0.001) is located between stages 3 and 4, that is, a little later than the Wanmax as has been noted by several authors (KEMPER, 1985; Pineau, 1991; BUCKLER, 1990).

Thus, these indices (Wanmax and Fo) can be faithful indicators for the sporty orientation, monitoring and evaluation of the effect of training during puberty (Van PRAAGH 2007; MAYLIST AMAS et al., 2002; VAN PRAAGH, DORE, 2002). Otherwise the very significant change (p <0.001) of the maximum speed (Vo) between stages 2 and 3 in parallel with the substantial increase of the Wanmax and Fo is indicative of severe muscle biochemical changes related to the metabolism anaerobic glycolysis described in the literature (HERMANSEN and OSEID 1971; DUCHE, BEDU and VAN PRAAGH, 2001; MELICHNA et al., 1983). In this sense several authors (Pineau, 1991. Weltman et al, 1986) showed that at this stage of sexual maturation, hormone secretion, particularly the increase in testosterone levels in males affects the great changes that appear in maximal strength and speed-strength

and anaerobic capacity. The maturation may be a factor behind the increase in anaerobic power alactic (DUCHE et al., 2001). According VAN PRAAGH (1990) that power in young children is significantly lower than in adolescents and adults in absolute and relative terms. The growth of androgen production is almost simultaneous with that of the maximum force. Pubertal phase is a pivotal period corresponding to a sudden production of sex hormones with anabolic properties which allow the development of the musculature (Armstrong et al., 2000; Degache et al., 2010). Also suitable training in strength and speed especially in the pubertal stage is of paramount importance for the future development of the performance of adolescents (KEMPER and NPV of KOP, 1995; KHIAT and MEHDIOUI, 2000; MANNO 1990; AMAS et al, 2002).

## 5. CONCLUSION

It appears that genetic dispositions appear to be involved for a significant part in determining the physical performance requiring aerobic metabolism and / or anaerobic. The transition from the second to the third stage of puberty seems decisive in the evolution of the main morphological and physiological parameters of effort (TOMKINSON, 2007; ALMUZAINI, 2007). For ethical and methodological reasons there are few studies (in particular longitudinal) on anaerobic capacity of children and adolescents .In the future the use of the technique of nuclear magnetic resonance (NMR) should offer interesting opportunities investigation of stress metabolism in children.

Objective assessment of physical abilities depending on the biological maturation stage thus proves to be a key and essential element of the training process, present in all stages of its development to edit, correct, adjust, select and / or guide preparation of the young athlete in a manner best suited to its potential.

## 6. REFERENCES

1. ALMUZAINI K.S. (2007) Muscle function in Saudi children and adolescents: relationship to anthropometric characteristics during growth. *Pediatr Exerc Sci ; Vol. 19 (3), pp.319-33.*
2. AMAS M.T., ERRON F.F., NOURY-DESVAUX B., ABRAHAM P., SAUMET J.L. (2002). Influence de la maturation et de l'entraînement sur la puissance maximale anaérobie alactique. *Cinésiologie n° 205- 41e année- p 109.*
3. L. AIRES, LB Andersen, D Mendonça, C Martins, G Silva, J Mota (2010); A 3-year longitudinal analysis of changes in fitness, physical activity, fatness and screen time *Acta Pædiatrica n° 99, pp. 140–144.*
4. ARMSTRONG N., KIRBY J., McMANUS A.M. et WELSMAN J.R. (1995) ,Aerobic fitness of prepubescent children. *Ann. Hum. Biol. 22: 427-441.*
5. **ARMSTRONG N.; WELSMAN J. R.; WILLIAMS C. A.; KIRBY B. J. (2000) Longitudinal changes in young people's short-term power output.** *Medicine & Science in Sports & Exercise, 32(6):1140-1145.*
6. ASTRAND P.O. (1976), The children in sport and physical activity-physiology. J.G.Albinson and G.M. Andrew (ed.). *Child in sport and physical activity.* Baltimore: University Park Press, pp. 19-33.
7. BUCKLER J. (1990) A longitudinal study of adolescent growth. Springer verlag, London, Berlin, 430 p.
8. DEGACHE F., Richard R., Edouard P., Oullion R., Calmels P. (2010) The relationship between muscle strength and physiological age: A cross-sectional study in boys aged from 11 to 15. *Annals of Physical and Rehabilitation Medicine, 53 : 180–188.*
9. DELGADO A., ALLEMANDOU A. and PERES G. (1992) Evolution des qualités anaérobies et ages civil, statural et pondéral et stades pubertaires. *Sciences & Sports, 7 : 37-38.*
10. DELGADO A., ALLEMANDOU A. and PERES G. (1993) Changes in the characteristics of anaerobic exercise in upper limb during puberty in boys. *Eur. J. Appl. Physiol., 66 : 376- 380.*
11. Duché P., Bedu M. et Van Praagh E. (2001) Explorations des performances anaérobies de l'enfant. Bilan de 30 ans de recherches. *STAPS, 54 : 109-130.*
12. DURNIN J. and RAHAMAN M.(1967).The assessment of amount of fat in the human body from measurements of skinfold thickness. *Br. J. Nutr. 21: 681-689 .*
13. GRODJINOVSKAYA A. and BAR-OR O. (1984) Influence of added physical education hours upon anaerobic capacity, adiposity, and grip strength in 12-13 years old children enrolled in sports class, in Ilmarinen J. Valimaki I. (eds): *Children and Sport.* Berlin, Springer Verlag, pp. 162-169.
14. HERMANSEN L. and OSEID S. (1971) Direct and indirect estimation of oxygen uptake in pre-pubertal boys. *Acta Paediatrica Scandinavia, 217: 18-23 (suppl.).*
15. HERTOCH C., MICALLEF J.P. et MERCIER J. (1992) Puissance anaérobie maximale chez l'adolescent (étude transversale). *Sciences et Sports, 7 : 207-213.*
16. KHIAT B. et MEHDIOUI H. (2000) Incidence des paramètres physiologiques de l'effort sur l'orientation de l'entraînement selon l'âge pubertaire. *Sciences et Technologie du Sport, n°3 :34-40.*
17. KEMPER H.C.G. (1985) Growth, health and fitness of teenagers. *Medicine and Sport Science, vol. 20, Ed. Hebbink: 202 p.*
18. KEMPER H.C.G. et Van de KOP H. (1995) Entraînement de la puissance maximale aérobie chez les enfants pré-pubères et pubères. *Science et Sports, 10 : 29-38.*
19. LACOUR J.R. (1992) Biologie de l'exercice musculaire. Edition : Masson, 199 p. MAYLIST AMAS et coll. (2002) Influence de la maturation et de l'entraînement sur la puissance maximale anaérobie alactique. *Cinésiologie n° 205- 41e année- p 109*

20. MANNO R. (1990) Les bases de l'entraînement sportif. Edition : Revue E.P.S.,223 p.
21. MELICHNA J., HAVLICKOVA L., MACKOVA E., SPYNAROVA S. and NOVAK J. (1983) The composition of the muscle fiber types in junior middle-distance runners. Physician and Physical Education 6: 28-31.
22. MURASE Y., KOBAYASHI K., KAMEI S. and MATSUI H. (1981) Longitudinal study of aerobic power in superior junior athletes. Medicine and Science in Sports and Exercise, 13: 180-84.
23. ORTEGA F.B. et coll. (2011) Physical fitness levels among European adolescents: the HELENA study. Br J Sports Med n°45:20–29.
24. PINEAU J.-C. (1991) Importance de la puberté sur les aptitudes physiques des garçons scolaires. Bull. et Mém. De la Soc. d'Anthrop. De Paris, t. 3, n°3-4 : 275-286.
25. RATEL S., Martin V. (2012) Les exercices anaérobies lactiques chez les enfants : la fin d'une idée reçue ? Science & Sports n°27, 195—200.
26. TANNER J.M. (1962) Growth at adolescence (2nd ed). Oxford, Blackwell Scientific Publications.
27. TOMKINSON GR. (2007) Global changes in anaerobic fitness test performance of children and adolescents (1958-2003). Scand J Med Sci Sports , Oct; Vol. 17 (5), pp. 497-507.
28. VAN-PRAAGH E., (1990) Evolution du métabolisme aérobie et anaérobie au cours de la croissance, revue S.T.A.P.S, p291-306
29. VAN-PRAAGH E, Doré E. (2002) Short-term muscle power during growth and maturation. Sports Med n°32:701–28.
30. VAN-PRAAGH E. (2007) Physiologie du sport: enfant et adolescent. De Boeck Supérieur, 288 pages.
31. VANDEWALLE H. et FRIEMEL F. (1989) Tests d'évaluation de la puissance maximale des métabolismes aérobie et anaérobie. Science et Sports, 4 : 265-279 .
32. WELTMAN A., JANNEY C., RIANNS C.B. and al. (1986) The effects of hydraulic resistance strength training in pre-pubertal males. Med. Sci. Sports Exerc. 18: 629-638, .
33. ZAUNER C.W., MAKSUD M.G. and MELICHNA J. (1989) Physiological considerations in training young athletes. Sports Medicine 8 (1): 15-31.

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# FORECASTING CROSS FITNESS TEST OWN FOOTBALL RULES, ACCORDING TO SOME PHYSIOLOGICAL VARIABLES

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## Abstract

The current study aims to reach a formula predictive for the purpose of identifying the ability of football referees in passing your physical fitness test has been the study on a sample of (25) the rule of first class and make a test of maximum oxygen consumption (Bruce) and using fitmat pro device and some lung variables using Sbirumeter device and the concentration of lactic acid in blood using lactic device pro meter. The current study found several results of the most important is that the equation predictive to pass the test of 150 m variables vo2max and the concentration of acid include lactic blood either equation predictive own test of 40 m it is found that vo2max vital capacity and capacity exhaled variables forced.

**KEYWORDS:** Vo2max. VC. FVC. Prediction.

## 1. INTRODUCTION

There is a group of multiple tests (literal, physical, theoretical) that must be crossed by football referees in the whole world, as the failure of one of those tests, it will lead to a lack promoted from grade to another, and in the assigned tasks and external obligations and the most important difficulties faced by the football rule, especially in Iraq is pass a physical test, carried out by the international Federation of Football (FIFA) during the past few years to amend those tests, as it was in the past based on the Cooper test (12 minutes running) because of the substantial evolution in physical performance the skill of speed in performance, which led to the development or adoption of a new test owned to football rulers fitness and when Note that the test will note that compound between high speed and carry speed and so the there is a physiological and physical requirements of the new must be enjoyed by football referees including the physiological capacity of which (the maximum consumption of oxygen, the concentration of lactic acid, and variables lung) as well as other physical abilities. As long as there is a range of physical and physiological variables, it necessitated the development of governance and the development of the most important physiological capacity or physical, which enables it to pass your physical fitness test, and therefore became the preparedness process possibility of passing judgment soccer physical test from the standpoint of physiological's very important for several reasons, the most important stand the most important physiological capacity that could be the development of physical performance and it is possible to hold the other physiological tests in addition to the physical as possible to stand on the possibility of passing your physical fitness test, if we know that the process of preparedness contribute to shortcut the effort, time and money in the training process in general.

(Faff J. and others, 2007) was accurate prediction of  $\dot{V}O_2\text{max}$  obtained from submaximal ratings of perceived exertion and heart rate during exercise. Of note, in the last few years, in spite of the great technical progress in construction of modern equipment to measure oxygen uptake, new methods to predict  $\dot{V}O_2\text{max}$  have continued to be developed and are considered to be very useful, particularly in studies of large population samples.

### The purpose of the study:

The purpose of the study is to predict the ability of football to pass judgment on their fitness International Federation of Football test (FIFA) the most important in terms of lung variables and maximum oxygen consumption and the concentration of lactic acid.

## 2. MATERIAL AND METHODS

Sample: The sample included (25) the rule of first class between the ages (25-32 years) and weight (72 kg) were measured as a range of physiological and physical variables of their own.

### The studied variables:

1. Concentration in blood lactic acid.
2. Vo2 max.
3. Lung variables include: (VC, TLC, VC, FVC1, FVC, FVC1, and FVC).
4. Special referees physical fitness test.

**Main experience:** Was a major experiment over three stages, with the maximum oxygen consumption measurement in the first stage, and after the measured concentration of lactic acid after physical effort with fitness own rulers football test in the second phase, and in the third stage was measured lung variables (FVC, FVC, FVC, FVC, TLC, VC).

### Physical tests and physiological measurements:

#### Special football rulers fitness test:

First rulers:

- 40 m × 5.90 seconds was repeated 6 times
- 150 m × 30 seconds was repeated 20 times
- 50 m × 30 walked again repeated 20 times

Second assistants:

- 40 m × 5.80 seconds was repeated 6 times
- 75 m × 15 seconds was repeated 20 times
- 15 m × 20 walked again repeated 20 times
- Allowed to rule warning only in the 150 m test and re-only once in the test 40 m, as well as Assistant alarm in 75 AD and re-once in 40 AD.

**Measure the concentration of lactic acid after the effort:**

Was measured lactic acid blood for (25) provision for football after doing their fitness test your physical containing (40 m × 6 recurrence and 150 m × 20 repeat) since leaving the judgment period (5 minutes) after physical effort was measured lactic acid using a device (Lactic Pro meter), as was the use of more than one device to ensure rapid access to blood samples from the rulers who were divided into four groups when performing special fitness test called (FIFA).



Figure 1 illustrates the device measuring lactic acid in blood.

**The maximum oxygen consumption measurement (Vo2 max):**

The maximum measurement of oxygen consumption using a device (Fit mat pro) and by working on moving traffic device (Tread mill) depending on the test (Bruce) set out the details in the figure below, as it includes a working length (21 minutes), divided into seven stages by (3 minutes) for each final stage of each stage is to increase the speed (km / h) and the degree of inclination (%), as shown. As it has been every day three rulers to measure and thus continued to measure (Vo2 max) for eight days.

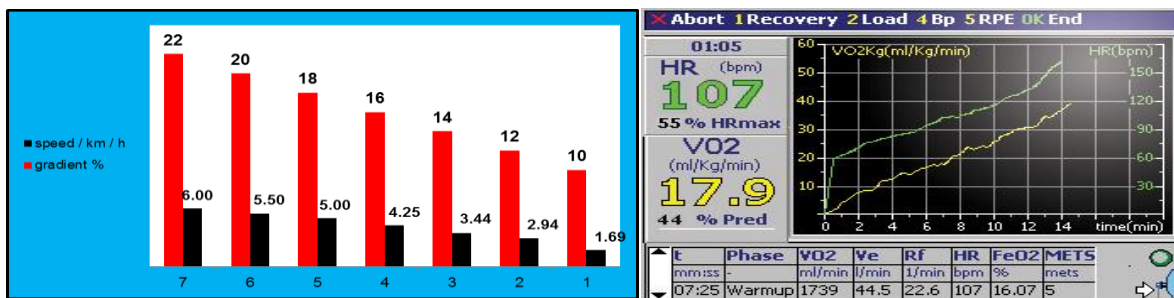


Figure 2 illustrates the Bruce test to measure the Vo2max and interface software to device Fit mate

**Measuring lung variables:**

Was measured lung variables using Spaarometr device making company (BTL) English as has been measured (FVC1, FVC) through its own profile of a (Force) as it is taking quick inspiration with a very fast exhalation repeat work for three times after being read the results of the screen directly. As for (TLC, VC) has been using the same device with the profile, as it has been to use a different tactic for the first case, as shown in the figure below, has been conducting measurements after taking personal information full for each rule (name, age, height, weight, smoking) was given a rest for (5 minutes) between the measure and another.

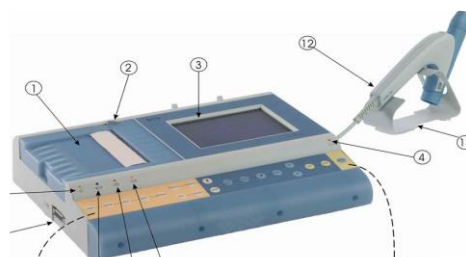


Figure 3 shows a device for measuring lung Sbirumatr variables

### 3. RESULTS AND DISCUSSION

**Table 1 shows the circles calculations and standard deviations to test your ruler's football and physiological variables fitness:**

	M	S. D	N
150 M	28.0800	1.25565	25
40 M	5.4452	.19954	
VO2max	55.4640	2.39859	
L.A	12.3800	.70887	
FVC	3.8624	.41179	
FVC1	3.8364	.40236	
FVC1/FVC	99.3600	.94064	
IC	4.2176	.42979	
VC	5.4684	.47083	
TLC	6.8648	1.42790	

**Table 2 shows the highest correlation coefficient values and the percentage of contribution and moral links to two variables vo2max, lactic acid test with 150 m**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Change Statistics		
							df 1	df 2	Sig. F Change
1	.788a	0.62	0.604	0.79	0.62	37.6	1	23	0
2	.835b	0.7	0.67	0.721	0.077	5.61	1	22	0.03

a. Predictors: (Constant), vo2max

b. Predictors: (Constant), vo2max, lactic acid

**Table 3 shows the contribution of variables in building predictive equation to test the 150 m values:**

Coefficients (a)

Model	Unstandardized Coefficients		Standardized Coefficients			
		B	Std. Error	Beta	t	Sig.
1	(Constant)	50.95	3.73		13.64	0
	VO2max	-.412-	0.07	-.788-	-6.129-	0
2	(Constant)	45.89	4.02		11.41	0
	VO2max	-.432-	0.06	-.825-	-6.971-	0
	L.A	0.496	0.21	0.28	2.368	0.027

**Prediction 150m test = 45.89 – 0.432 × Values of vo2max + 0.496 × Values of lactic acid**

Shown in the table (3) crossing the highest form links between the studied variables for the respiratory system and maximum oxygen consumption and blood concentration of lactic acid. As it emerged that these variables had a correlation with variables (Vo2max) and the concentration of lactic acid, the variable (Vo2max) contributed by (60%) to achieve best accomplished through the test (150 m) has a contribution of both variables by the largest amount (0.67) and came adequate results are in line with the test distance and nature of the physiological and this means that there is a large key role in the predictability of the removal of the (150 m) to test football fitness rulers, as it is also known that this test includes 30 again and a time not to exceed (30 seconds) this means that the lactic system is the main charge of the processing required to complete the muscle work required energy and hence the rulers during this test that they have a large capacity to bear the accumulation of lactic acid production for this effort in order to complete the muscle work required a (150 m × 30 repeat) a time does not exceed (30 seconds) maximum, so the nature of the test imposed on the body work devices to maintain the speed part of the race with an accumulation of lactic acid in the muscles currency and blood sports, without landing speed for more than (30 seconds) as a time to accomplish that effort.

As for the reason for the contribution of variable (Vo2max) in the equation predictive to pass the time (150 m), the maximum oxygen consumption associated efficiently three main devices are periodic, respiratory, muscular, with the main function of the league for two devices and respiratory reflected in the provision of adequate (O2 quantity) and rid the body, (CO2) produced in the working muscles muscular As for the device, the muscle efficiency in extracting large amounts of (O2) passing through the capillaries have a role in increasing the oxygen consumer.

(McLaughlin J.E and other, 2010) Maximal oxygen uptake (VO<sub>2</sub>max) is generally believed to be the best measure of cardio-pulmonary fitness and aerobic performance. The most accurate method of VO<sub>2</sub>max estimation is direct measurement of oxygen uptake during maximal exercise. This method is, however, troublesome because of the necessity of a thorough medical check-up before exercise and continuous supervision of the exercise test by a physician trained in treatment of circulatory failure. In addition, appropriate laboratory equipment for direct measurement of VO<sub>2</sub>max is rather expensive and requires skilled personnel.

(Abou El Ela Ahmed, Ahmed Nasr eddin, 1993) Confirms that functional capacity became one of the factors upon which the modern training to raise the level of performance, and without it cannot move the sports level, and between these functional capabilities, is the maximum oxygen consumption development. It cannot be said of the muscles continue to muscle work without oxygen (anaerobic) more than (10) seconds, while the muscle can continue to work for more than a minute in the case of continuing to supply the muscle with oxygen through the transfer from the lungs to the working muscles. On the other hand, the (Vo<sub>2</sub>max) is an indication of the maximum aerodynamic potentials, which have an important role in delaying the accumulation of lactic acid in muscle, working as well as increasing the possibility of the body to get rid of lactic acid therefore predictability in time, who turns judgment Football distance (150 m) possible to predict through these two variables (Vo<sub>2</sub>max, lactic acid in blood). Points (Bahauddin safety, 2000) that there is a relationship between blood lactate and bearing performance and because of the blood lactate seem more sensitivity training as a system of maximum oxygen consumption, the training programs need to be more specialized planning to lead to undesirable responses. In studies conducted on runners and then the follow-up changes (Vo<sub>2</sub>max) and lactic acid show that the enemy has led to an improvement in the oxygen consumer and increased lactate blood are linked quickly the enemy, but the change in the ratio of lactate was linked to the performance of the enemy with a greater degree of (Vo<sub>2</sub>max). It was reported (Jabbar Rahima, 2007) that (Vo<sub>2</sub>max) index on the efficiency of functional devices, which include periodic respiratory efficiency in the delivery of this inspiration into the blood, which depends on the ability of the lungs and the ability of hemoglobin to unite with oxygen as well as the efficiency of the delivery of (O<sub>2</sub>) into the blood and relies mainly on the speed of the circulatory system and the ratio (HP) in the blood.. As well as muscle efficiency in extracting oxygen depends on the distribution of blood in the muscles and capillaries.

**Table 4 shows the highest correlation coefficient values and the percentage of contribution and moral links to two variables vo<sub>2</sub>max, FVC, VC test with 40 m.**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			
						F Change	df 1	df 2	Sig. F Change
1	.444a	0	0.16	0.2	0.2	5.6	1	23	0.03
2	.615b	0	0.32	0.2	0.18	6.4	1	22	0.02
3	.714c	1	0.44	0.1	0.13	5.6	1	21	0.03

a. Predictors: (Constant), vo<sub>2</sub>max

b. Predictors: (Constant), vo<sub>2</sub>max, FVC

c. Predictors: (Constant), vo<sub>2</sub>max, FVC, VC

**Table 5 shows the contribution in building a predictive equation to test 40 m values of the variables**

**Coefficients (a)**

Model		Unstandardized Coefficients Standardized Coefficients				
		B	Std. Error	Beta	t	Sig.
1	(Constant)	7.493	0.863		8.682	0
	VO <sub>2</sub> max	-.037-	0.016	-.444-	-2.375-	0.026
2	(Constant)	7.104	0.791		8.98	0
	VO <sub>2</sub> max	-.045-	0.014	-.536-	-3.119-	0.005
	FVC	0.211	0.083	0.436	2.538	0.019
3	(Constant)	6.144	0.825		7.446	0
	VO <sub>2</sub> max	-.045-	0.013	-.545-	-3.487-	0.002
	FVC	0.248	0.077	0.513	3.213	0.004
	VC	0.157	0.066	0.37	2.371	0.027

**Prediction 40m test = 6.144 – 0.045 Values ofvo<sub>2</sub>max + 0.248 × Values ofFVC + 0.157 × Values of VC**

Shown in Table (4) that there is a percentage of the amount of the contribution (82%) for the three physiological variables are (forced expiratory capacity, and maximum oxygen consumption, and vital capacity) accomplishment (40 m × 6 iterations) or that the test conditions are imposed on the player with a time of (6 seconds) to complete the muscle work at low speeds during the 6 iterations. The reason for this link or contribute to these changes the fact that work in accordance with the thrill of the mechanism that the body depends on the anaerobic system phosphate mainly the fact that the time periods for the effort does not exceed (6 seconds) and periods of rest between the frequency and the last (60 seconds) and this rest period to allow re what has been consumed



(ATP) within the muscle cell with the amount of retrieval ( $O_2$ ) consumed during the effort. This requires that the circulation and breathing devices with high efficiency, so it notes that the forced time capacity. Vital capacity, one of the variables that give an indication of the respiratory efficiency of the rule of being a results of several sizes pulmonary them inspiratory and expiratory reserve Air normal size, they are one of the variables that can predict which in the digital delivery of the rulers in the test ( $40\text{ m} \times 6$  iterations) in addition to The index most assessment of functional efficiency of the physical, which ( $Vo_{2max}$ ) which is also contributed to traverse those predictive equation because the athlete or trainee different levels must have the ability maximum aerobic has a good level to be able to bear the burden of training and competition if we know the aerodynamic possibilities one delay fatigue factors resulting from the accumulation of lactic acid during the competition, so the football referees have a good capacity through the ( $Vo_{2max}$ ) is an indication of good training, confirms (Bahauddin safety, 2002) that the maximum oxygen consumption to reduce the scale is a measure integrated four most important vital organs during the performance of a respiratory and circulatory system and muscle and blood, so dependent upon laboratory physiological calendar sports state training and physiological mentions (Hazza Mohammed Al-Hazza, 2009) that the volume of air that can get him out of the lungs at the end of the first second after taking Screened deeper inspiration as possible, which is a good indicator of the strength breathing muscles and safety of the pulmonary system of respiratory diseases, and can also use the volume ratio of forced expiratory when the first second to the vital capacity and forced (Forced vital capacity) as an indicator of the integrity of the respiratory tract of respiratory diseases, and this percentage should be not less than 75% of vital capacity and forced . And points (Mohammad Hassan Allawi and Abu Ela Abdel Fattah, 2000) that the volume of air that comes out in exhaled during the first second after maximum inhalation, usually of air exhaled volume during this time (80%) of the vital capacity and associated air volume strongly muscles exhale and the degree of resistance air in the airways. And remember (Nahla stubbornness mystic, 1999) the percentage of the volume of exhaled disappearance (FEV), a relationship between the ratio (FEV1) and (FVC) any ( $100 \times FEV1 / FVC$ ) and use the volume exhaled disappearance (FVC) and the volume of exhaled disappearance in the first second (FEV1) and the ratio between them all, a preliminary guide to the interpretation and examination of spirometry and if I say the ratio between the two is the index of the blockage of the airways, and that the ratio between the size of the natural exhalation disappearance in the first and the second is Forced expiratory volume (70%).

#### 4. REFERENCES

- 1- Mohammad Hassan Allawi, Abul-Ela Ahmed Abdel Fattah: Physiology of sports training, Dar Al Arab Thought, Cairo, 2000.
- 2- Nahla stubbornness mystic: spirometry, Medical Bulletin (10) Al-Razi hospital in Mosul 0.1999.
- 3- Abu Ela Ahmed, Ahmed Nasreddin: Physiology of fitness, Dar Arab Thought, Cairo 0.1993.
- 4- Bahauddin safety: Bulletin athletics, Regional Development Center, Cairo 0.2002.
- 5- Hazza bin Mohammed Al-Hazza, Exercise Physiology (the theoretical basis and procedures for laboratory measurements of physiological), King Saud University, and Riyadh 0.2009.
- 6- Bahauddin safety, physiology of sport and physical performance (blood lactate), Dar Al Arab Thought, Cairo 0.2000.
- 7- Jabbar Rahima, chemical and physiological basis of athletic training, Doha 0.2007.
- 8- Faff J., Stokowski D., ladyga M., Klusiewicz A., Borkowski L. Starczewska-Czapowska J. Maximal heart rate in athletes. Biol. Sport 2007; 24:129-142.
- 9- McLaughlin J.E., Howley E.T., Basset D.R. Jr, Thompson D.L., Fitzhugh E.C. A test of the classic models or predicting endurance running. Med. Sci. Sports Exercise. 2010; 42:991-997.

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# IMPACT ON THE DEVELOPMENT OF PRACTICAL LESSONS FITNESS CARDIOVASCULAR SYSTEM VASCULAR TO STUDENTS OF THE FACULTY OF PHYSICAL EDUCATION MUSTANSIRIYA UNIVERSITY

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## Abstract

Was and faculties of Physical Education remains the focus of attention for many of the students' attitudes toward exercise and the consequent health implications for the body and these reflections take large grants and a vast difference from the accepted students have a physical and skill background such as belonging to one of the clubs compared to the accepted students from non-practitioners of the sport these are things that will create a situation of differences among students in terms of fitness and skill level, and that this positive for practitioners and negative differences will be reflected in the coating of non-practicing and therefore what would be a burden on the fitness and physiological changes level, including the heart, thus creating a difference range in the student response to the practical exercises and lessons the study aims to identify the Atheraldros process to develop the fitness of the heart muscle as well as the comparison between Fitness cardiovascular system for students who play sports and belong to sports clubs and students who do not exercise does not belong to sports clubs have researchers used the descriptive approach manner comparative studies because it is the most appropriate means to resolve research problem and sample consisted search of (15) students from the first stage \_ Faculty of Physical Education students, in the form of three first set groups consisted of (5) request athletes in the Iraqi clubs and the second group consisted of (5) request non-athletes from non-practicing sports and the third group consisted of (5) Girls, has formed a selected sample who underwent testing for no percentage (16.3%) of the research community and the results of the study concluded that the exercises given in the practical lessons did not affect the athletes while the group weighed heavily on a group of students and a group is athletes.

The Cardio Fitness Aerobic among female students was better than a sophisticated group of athletes and non-athletes

**KEYWORDS:** Practical lessons. Fitness. Cardiovascular fitness. Heart muscle.

## 1. INTRODUCTION

Is the physical education of the most important factors helping to organize the work of the various human body organs and in the right amount of functional performance of the man they gain physical and mental health, as well as textures and sound consistency in the movements and correct performance sports movements .sport has many benefits, including: (maintaining weight, obesity prevention, prevention of diabetes and high blood pressure, heart disease, strengthen muscles of the body, mitigation of diseases of the joints and rheumatism and osteoporosis, improve mental and moral case where it helps to relieve anxiety, depression and psychological problems burning the excess fat in the body. Physical Education of the most important factors helping to organize and improve and the development of various organs of the body normal and sports for man, one and the heart of the task forces in the human body normal and sports, in particular, where this muscle is affected when you exercise and increase their ability to work, we find that the person who practiced the sport in the form daily or usual has a high fitness, as well as the muscle heart has more flexibility to withstand any effort by the person and whatever the size of this effort, either on the contrary, we find fitness loss of body negative effect on the heart muscle affects may sometimes lead to stop this muscle for work leading to sudden death and the importance of this muscle for the athlete, in particular, many of the sporting events depends perform on the efficiency of this muscle, has tended to study many of the research, conducted several studies, especially in the field of Education, Sports and specialists in this matter, as well as in colleges of education athletes through the tests as well as lessons and lectures, practical given in the colleges of physical education in terms of the number of hours and the number of lessons per day where these colleges includes many of the students athletes and non-athletes and hence the necessity of studying these phenomena and their impact on these students. The importance of research to find out the impact of the practical lessons that are given in the faculties of Physical Education to develop fitness and efficiency of the heart muscle aerobic for students of the first phase especially because some of these students play sports and belong to sports clubs and several other of them do not play sports, creating a difference range in the student response to the exercises and practical lessons, which inevitably affects the fitness development, especially on fitness cardio-vascular system.

### Search problem:

Was and faculties of Physical Education remains the focus of attention for many of the students' attitudes toward exercise and the consequent health implications for the body and these reflections take large grants and a vast difference from the student will be acceptable to the friendly physical and skill background such as joining one of the clubs compared to the accepted students from non-practitioners of the sport and this things that will create a situation of differences among students in terms of fitness and skill

level, and that will be reflected these differences positive for practitioners and negative coating non-practicing and therefore what would be a burden flocks fitness and physiological changes, including the heart, thus creating a difference range in the student response to the practical exercises and lessons.

**Research Aim:**

- 1-recognize the effects of practical lessons to develop fitness of the heart muscle.
- 2-comparison between cardiovascular fitness regime for students who play sports and belong to Sports clubs and students who do not exercise does not belong to sports clubs.

**2. MATERIAL AND METHODS**

The researchers used a descriptive approach style of comparative studies for being the most appropriate means to resolve the problem of the research.

**The research sample:** Sample consisted Find (15) called for the first phase of Physical Education College students, in the form of three first set groups consisted of (5) requested by the athletes in the Iraqi clubs and the second group consisted of (5) request non-athletes from non-practitioners of the sport and the third group consisted of (5) Girls, has formed a selected sample who underwent testing for no percentage (16.3%) of the research community.

**Table 1: shows the values of the mean and standard deviation of the sample and sprains Search:**

No	Variable	M	S.D	Sprains
1	Age	20.5333	0.580	0.368
2	tallness	164.6000	0.580	0.368

The table shows (1) that the value ranging from sprains (-3, +3) and this van homogeneous sample.

Tests used

Carlson test: (Mohamed Nasr eddin Radwan, 1998: 103)

Find field procedures.

The researchers have conducted your test determine cardiovascular fitness on 11/20/2014 10:00 pm on the same search Researchers took into account the importance of conducting the test with high accuracy through their direct supervision to support staff.

**3. RESULTS AND DISCUSSION**

**Table 2 shows the results calculated and tabular test (F), and analysis of variance between the three groups Search.**

Variable	Source of variation	Sum of squares	Degrees of freedom	Squares average	F Calculated	F Tabulated	Sign
Pulse at rest time	Between groups	436.800	2	218.400	0.901	3.88	Random
	Within groups	2908.800	12	242.400			
Pulse after 10 eighth end the test	Between groups	1915.200	2	957.600	2.525	3.88	Random
	Within groups	4550.400	12	379.200			
Pulse after 2 d end the test	Between groups	218.133	2	109.067	0.362	3.88	Random
	Within groups	3612.800	12	301.067			
Pulse after 4 d from the end the test	Between groups	619.200	2	309.600	1.969	3.88	Random
	Within groups	1886.400	12	157.200			
Pulse after 6 d from the end the test	Between groups	537.600	2	268.800	7.467	3.88	Moral
	Within groups	432.000	12	36.000			
Number of times the right foot touching the ground	Between groups	10900.933	2	545.467	10.514	3.88	Moral
	Within groups	6220.800	12	518.400			

**Table 3: shows the results of the test (LSD) after 6 minutes of the end of the three test groups:**

Variable	Measurements	Circles teams	value of L-S-D	Significance	Error rate
Diagnostic test after 6 minutes of ending the test	First- second	4.8000	0.230	Random	0.05
	First- third	* 9.6000	0.026	Moral	
	Second- first	4.8000	0.230	Random	
	Second- third	* 14.4000	0.03	Moral	
	Third- first	9.6000	0.23	Random	
	Third- second	14.4000	0.003	Moral	

**Table 4: shows the averages pulse time to rest with pulse after (6 min) of the end of the three test groups.**

Groups	Averages at rest time	Average after 6 min
First group	64	72
Second group	75	76

Third group	76	62
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**Table 5: shows the test results of L- SD to calculate the number of times the foot touching the ground, the three groups.**

Variable	Measurements	Circles teams	value of L-S-D	Sig	Error rate
Test a number of times right foot touching the ground	First- second	* 40.6000	0.015	Moral	0.05
	First- third	24.8000	0.111	Random	
	Second- first	*40.6000	0.015	Moral	
	Second- third	65.4000	0.001	Random	
	Third- first	24.8000	0.111	Random	
	Third- second	*65.4000	0.001	Moral	

1- (pulse time to rest) back from the table (2) random differences between the groups for the variable (pulse time to rest), the researchers attributed to the lack of physical exercises develop the endurance to contribute to the expansion of the size of the cavities attack as expanding the size of the cavities heart contributes to low heart rate the physical training leads to increased batch size or the amount of blood pumped by the heart in every blow of the strikes, which makes the heart more efficient in his work and thus can meet the demand for blood by different parts of the body with fewer strikes.

The researchers also believe that the random difference between the three groups due to poor fitness, which provided physical exercise lessons practical level.

"The pulse rate at rest is a measure of fitness and decreases slowly when you get to the level of more than fitness" (HolHolmyard, D. J, 1994) and thus have achieved the first goal did not come first hypothesis.

- Pulse rate (after (10 sec) to end the test): - shown in Table (2) is also a random difference between the groups (variable pulse after (10 sec) to end the test (where is this period of time from within the periods restore reserves of oxygen in the body) (Claudia Hernandez, 2001) and thus have achieved the first goal did not come first hypothesis.

3. (pulse rate after (2 d) and 4 (d) of ending the test): - Azarmen (Table 2) also random difference between the groups in the variables of the pulse after (2 d) and 4 (d) of the end testing attribute the researcher that to equal the effect of exercise during practical lessons among all students (students, students). Despite the decline in the average pulse, a normal state (after landing exercise in pulse rate is a property essential for the control of sound independent autonomic nervous system that heart rate drops quickly through rate (min - 1.2) for the first time after exercise (-Niemeyer, L: Aronow, 2004593) and thus have achieved the first goal did not come first hypothesis.

4. (pulse rate after (6 d) of ending the test): - shown in Table (2) a significant difference between the three groups making the researcher resort to a census less teams moral (LSD) to see a significant difference between the groups, as the table shows (3) the results showed a significant difference between the first group and the second group and in favor of the first group and the second group and the third group and in favor of the third group and among the first group and the third group and in favor of the third set and this means that the return of pulse and adapt the heart muscle after the end of the effort b (6 d) for the third group (the students) was significantly better than the first and second groups (athletes and non-athletes) and this result reflects the adaptation of the heart muscle and an indicator of aerobic fitness to the heart muscle, and this result is achieved what the Fox (FOX \_E.L, 2000: 234)

As shown by the averages in the table (4) in this variable promises almost close to the resting pulse rate compared to the averages of time to rest for the three groups with the note a significant decrease in pulse rate after the end of the exercise to a group of students (third) and reflects the state of aerobic heart.

Since the size of the ventricle and the heart rate decreases after exercise is linked to the return of the pulse rate is accompanied by the increase in activity Barracmbthaway causing slower pulse rate must exercise to a large extent (Claudia Hernandez, 1995: 88).

It is noted (Table 4) that the pulse rate of the second group (non-athletes) returned to almost the comfort mode, while table showed delayed pulse rate return to the comfort of the first group put (athletes). The researcher believes that these differences back to the serious practice and commitment shown by the students towards the practical lessons which impact on the achievement of these results. Thus, the goal has been achieved and presumably search.

5. (Number of times right foot touching the ground): -

Showed (Table 2) significant difference in the analysis of variance, which led to the use of the researcher to the law (LSD), and so the table shows (2) a significant difference between the first set and the second in favor of the second group and between the second and third sets and in favor of the second and between the first and third sets and in favor of the first set and thus results show a group of athletes is achieved as a result of significantly better than the two groups of athletes and students (first and third) and attribute it to the researcher confident athletes exercises clubs, thus affecting the test result and in favor of the second group (non-athletes). Thus, the goal has been achieved and presumably search.

#### 4. CONCLUSION

1. The exercises given in the practical lessons did not affect the athletes while the group weighed heavily on a group of students and a non-athletes.
2. The Cardio Fitness Aerobic among female students were advanced best of athletes and non-athletes group.
3. Converging level of comfort as pulse rate of the three groups.
4. The level of convergent so low pulse rate among the three groups.



## 5. REFERENCES

1. Fadel full mentioned, summarized in anatomy for students of Mathematical Education Shuwaili printing office - BAGHDAD - 1429 -2008 m.
2. Fadel full mentioned, the entrance to the physiology in sports training, Baghdad, Shuwaili printing office 0.2007
3. Saeed Ismail reap the basic rules in scientific research - T1- Beirut Foundation message to Taba- 1994.
4. Mohamed Nasr eddin Radwan, methods of measuring physical effort in sport / book publishing center.
5. I I.1998.
6. Niemeyer, I: Aronow, H,y Kasman, G.(2004) . Apiolt study to in vestigate shoulder muscle fatigue during asustaional using surface EMG . American Journal of occupational therapy vol. 58,pp.578.(2004).
7. Holmyard, D.J. et al. (1994) Effect of recovery on per for mance during multiple treadmill sprints. London : F& FNSpon.
8. Fox, E.I.etal. (1993) the physiological Basis for exercise and sport . Othed . Madison : Brown & Bench mark.
9. Claudia, Hernandez, Traditional Semgfation applied to areal world, sport function activity: Round Hose kick,1995.

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# RELATIONSHIPS BETWEEN ILLINOIS AGILITY TEST AND REACTION TIME IN MALE ATHLETES

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## Abstract

Change-of-direction speed is an important quality to performance in multi-direction sports. To assess change-of-direction speed in their athletes, field sport coaches could use reliable and valid tests. Illinois agility test (IAT) was designed to assess field sport change-of-direction speed. This study analyzed the reliability and validity of IAT, through comparisons to Illinois agility test (IAT) and reaction time (RT) performance in highly-trained junior football players. **Methods:** Totally, 20 high school soccer (age:  $24.04 \pm 1.45$  years; height:  $175.75 \pm 4.95$  cm; body mass:  $70.91 \pm 8.90$  kg), completed three tests. IAT was evaluated using photoelectric cells timing gates. The software "REACTION" was used to measure RT in response to visual stimulus. For the validity analysis, Pearson's correlations ( $p \leq 0.05$ ) analyzed between-test relationships. **Results:** IAT was significantly correlated with RT ( $r = 0.55$ ;  $p < 0.05$ ). This study indicates that RT could be used as a valid predictor of IAT in field sport athletes.

**KEYWORDS:** Change of direction. Reaction. Football. Reliability.

## 1. INTRODUCTION

In many sports, such as football codes, sprints are generally short and of varying distances. Athletes in these sports will accelerate as much as possible in the shortest period of time. Agility and change-of-direction speeds are essential qualities for athletes who play field sports, such as soccer, American football, rugby league, rugby union and field hockey (Spencer, Bishop, Dawson, & Goodman, 2005). With the football codes, for example, short sprints occur throughout the game. Bloomfield, Polman, & O'donoghue (2007) reported that soccer players, on average, perform over 700 turns and swerves at different angles throughout a game. Therefore, sprint training for the type of sport, should include the need to accelerate (reaching the highest speed possible in the shortest time period), to decelerate and change direction throughout the game (Docherty, Wenger, & Neary, 1988).

Sports scientists, strength practitioners, and sports coaches habitually use testing of performance characteristics to monitor training adaptations, identify talent (Reilly, Williams, Nevill, & Franks, 2000), facilitate group selection (Vescovi, Murray, & VanHeest, 2006; Pyne, Gardner, Sheehan, & Hopkins, 2005), and differentiate between standards of play, such as youth versus professional (Leone, Lariviere, & Comtois, 2002). Significant correlations were found in soccer players between different physical fitness parameters and between changes in strength parameters and agility (Silva, Magalhães, Ascensão, Oliveira, Seabra, & Rebelo, 2011). Little and Williams (2005) reported that acceleration (10-m sprint times), top speed (flying 20-m sprint times), and agility were distinct motor characteristics in a group of professional male soccer players. Equally, significant correlations between performance in an agility T-test and 40-yard sprint time in both men and women have been established (Paule, Madole, & Lacourse, 2000). In contrast, Buttifant and Graham (1999) and Young et al. (1996) reported no significant correlations between straight sprinting and agility speed tests in either Australian soccer or Australian Rules football players. The results from these studies illustrate the difficulty in identifying how performances on various field tests can be related to one another.

Agility is an essential component in most field requiring high speed action (acceleration, maximal speed) and specially team sports competition. And agility is a combination of speed and coordination. Speed which provides movements, the speed and coordination is an elementary technical demand for sportive performance in football. In the same way, tests of agility have been shown to distinguish between playing standards in Australian rules football (Young, 1996) and netball (Reilly et al., 2000) as between different age groups and standards of play in rugby league (Gabbett et al., 2009).

The capacity of football player to produce varied high-speed actions and motor skills are known to impact performance. High-speed actions can be categorized into actions requiring maximal speed, acceleration, RT and agility. Therefore, there is no doubt that the cognitive component of agility is very important (Gabbett et al., 2008; Sheppard et al., 2006).

We thought that RT is an important cognitive component. RT is described as the interval between the onset of a signal (stimulus) and the initiation of a movement response (Magill, 2007). RT is one of the factors of great significance in competitive sports, especially in team games like football. To execute a correct movement a rapid response is required with minimal time interval due to the ball velocity and the physical proximity of the adversary (Shim, Chow, Carlton, and Chae, 2005). Thus, the RT of a player is considered as the key to performance. A decreased RT affords a player more time to consider the proper execution of an appropriate movement. The RT duration could be affected by several factors, but the most direct influences are external stimuli (Lin, 2001). For that, we considered that this cognitive component which is the RT could be associated to agility.

Thus, field tests used to control performance often include assessment of linear sprinting, the ability to change directions, agility, jumping, and aerobic capacity (Cronin & Hansen, 2005; little & Williams, 2005). However, to date, there are not or rare studies and discussions relating to agility and RT tests. Thus, the main purpose of this study was to examine if there is any relationship among Illinois agility and RT performance in male soccer players. IAT was selected because of its reported validity and reproducibility (Paoule et al., 2000; Roozen, 2004). Finally, we determined the coefficient of determination to indicate how much of the total variation in one test variable is explained by another. In our knowledge, the present study is the first investigation examining the importance of relationship between agility and other physical components such as speed with change of direction and RT in football players.

## 2. MATERIAL AND METHODS

**Subjects:** Participants included twenty student soccer male athletes (Characteristics in Table 1). All subjects were found to be in good health. The selected players possessed at least 8 years of experience in football training and competition, and took part in National championship at the time of the investigation. They thus continued football training three to four times per week (~ 90 min per session), and played one official game per week. The subjects were told that they were free to withdraw from the trial without penalty at any time. All procedures were approved by the Institutional Review Committee for the ethical use of human subjects, according to current national laws and regulations.

**Table 1:** Characteristics of experimental group (mean ± SD; n=20).

	Age (years)	Height (m)	Body mass (kg)	football experience (years)
mean ± SD	24.04 ± 1.45	175.75± 4.95	70.91 ± 8.90	10.3 ± 2.4

### Testing procedures

These tests were selected because of their reported validity and reproducibility (Roozen, 2004). All of the testing procedures were completed during the competitive season two months after the beginning of the national championship.

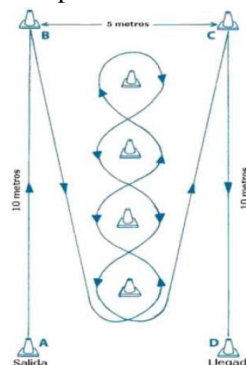
The Illinois agility test (IAT) was used to determine the ability to accelerate, decelerate, turn in different directions, and run at different angles (Figure 2).

The total testing session was approximately one hour for each subject which included warm-up, ten minute rest times between tests and approximately three minutes between reps. Each test was explained and demonstrated. Before testing, subjects were given practice trials to become familiar with the testing procedures. All tests were counterbalanced pre and post testing to ensure that testing effects were minimized. Before performing the field test, each player was instructed and verbally encouraged to give a maximal effort during all tests.

### Illinois agility Test

The Illinois agility test (IAT) was used to determine the ability to accelerate, decelerate, turn in different directions, and run at different angles (Figure 1).

Illinois agility tests: The length of the course was 10 m and the width was 5m. Four cones were used to mark the start, finish and the two turning points. Another four cones were placed down the center an equal distance apart. Each cone in the center was spaced 3.3m apart. The player lies in the prone position with his chin touching the surface of the starting line. The first light sensor is placed at the start line, 50cm above the ground. The light sensor will be activated as the subject moves from the prone position. The second light sensor is placed at the finish line. Timing gates were placed at the start and finish lines at a height of 0.30 m (Vescovi & Mcguigan, 2007) (Figure 2). On the researchers “Go” command the stopwatch was started and the participant got up as quickly as possible and ran around the course in the direction indicated while attempting to avoid any contact with the placed cones. He then runs towards the starting line’s middle cone, zig-zags through the cones downward and again upwards, sprints to the last cone on the far side and finishes at the finish line. Upon crossing the finish line the timing was stopped. Subjects performed two maximal attempts at each exercise with at least 2 min rest between tests and trials. The faster time taken and recorded in seconds.



**Figure 1:** Illinois agility Test (Cureton, 1951).

### Measurement of the reaction time (RT)

The software “REACTION” was used to measure the time of reaction using values (the value considered here is the mean and the evolution of the deviation from the different RT). This software includes various tests: comparisons of forms, appearances of forms, a form of recognition among others. The user could choose the color of various geometric figures or even choose static images (flowers, books ...). In this experiment the test was chosen as the recognition of a “blue square” among other figures (circles, triangles, square, and rectangle) of the same color. Each patient was asked to click on assessed as quickly as possible when he saw that form. Throughout the experimental period the individual should keep the same test with the same color and same shape. On the test day, all subjects were asked not to drink coffee, tea, cola and other drinks considered to have stimulant effects (21). In addition, we asked all subjects to sleep at night at the same time (21 h). All subjects evaluated in this study have never used the software before. Testing sessions were conducted at the same time of the day (at 12H 30 min), and under the same experimental conditions. Therefore a meeting of the recognition software was conducted during which each subject performed a familiarization trial in the two days prior to the main testing. All individuals were subjected to the test under the same conditions and have completed three trials during the test. Each trial consisted of ten times of reaction. All participants were tested using identical protocols and the tests were completed in a fixed order. Subjects performed each test 3 times and the results were averaged.

### Statistical Analyses

Data are reported as mean ± standard deviation (SD). Before using parametric tests, the assumption of normality was verified using the Shapiro-Wilk W test. Pearson correlation (*r*), linear regression analysis and the coefficient of determination (*r*<sup>2</sup>: used for interpreting the meaningfulness of the relation) were used to examine the relationships between IAT and reaction time. Significance was assumed at 5% (*p* ≤ 0.05). Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) (version 14.0 software for windows).

## 3. RESULTS

**Table 2: shows the mean (Mean ± SD), Min and Max values of IAT and RT obtained in the subjects. The range of IAT varied from 16.810 19.100 sec, while the RT score varied from 428 to 602 msec.**

**Table 2: Mean values (mean ± SD) of IAT and RT in the experimental group (N =20).**

	IAT (msec)	RT (msec)
<b>mean ± SD</b>	18.007 ± 0.688	525.350 ± 53.149
<b>Min</b>	16.810	428.000
<b>Max</b>	19.100	602.000

The correlation coefficient and coefficients of determination between IAT and RT tests are shown in Table 3. According to this table 3, A bivariate correlation matrix revealed a significant relationship between IAT and RT (*r* = 0.52; *p* < 0.05). This significant relationship was illustrated with a regression curve (figure 2). A significant positive partial correlation implies that as the values of RT increase, the values on the second variable (IAT) also tend to increase

**Table 3: The correlation coefficient (*r*) and coefficient of determination (*r*<sup>2</sup>) values between IAT and RT test in the experimental group (N=20).**

		Illinois Agility Test (sec)	Reaction Time (msec)
Illinois Agility Test (sec)	Pearson Correlation ( <i>r</i> )	----	0.525(*)
	Coefficient of determination ( <i>r</i> <sup>2</sup> )	----	0.27
	Signification (2-tailed)		0.017
	N	20	20

\* Correlation is significant at the 0.05 level (2-tailed).

**Table 4: The standardized and unstandardized Coefficients of correlation values (B and Beta) obtained about the linear regression between IAT and RT test in the experimental group (N=20).**

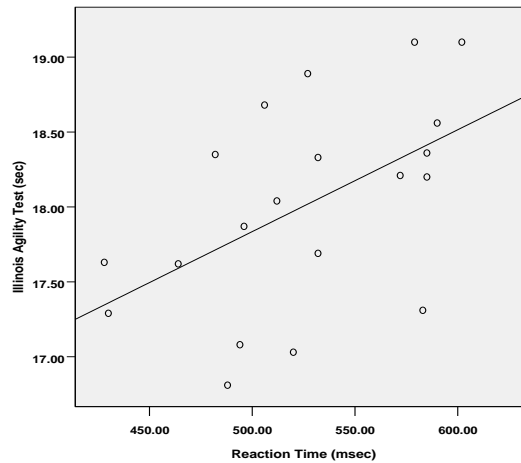
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.435	1.372		10.518	.000
	Reaction Time (msec)	.007	.003	.525	2.616	.017

Dependent Variable: Illinois Agility Test (sec)

A linear regression analysis was conducted on the bivariate data set to evaluate the prediction of IAT average from the subject s score of the RT. The results indicated that there is a linear relationship between the two variables. As the subject s score on the RT increased, their IAT performance also tended to increase. The regression equation for predicting the IAT is:

**Predicted IAT = 0.007 RT + 14.435**

The correlation between IAT and RT performance = +0.52 ( $p < 0.05$ ). This result explained that approximately 52% of the variance in the IAT performance was accounted for by its linear relationship with score of the RT (Table4).



**Figure 2:** Relationship between Illinois Agility Test (IAT) and the reaction time (RT). ( $r = 0.52$  ;  $p < 0.05$ ).

#### 4. DISCUSSION

There are few validated change-of-direction speed tests that assess an athlete's ability to sprint linearly, while also performing direction changes. IAT was designed for use in field sport athletes (Spencer et al., 2005). Our first objective in the study was to investigate the relationship between IAT and RT to provide some measure of validity. For the present study there was a positive correlation between the RT and agility ( $p < 0.05$ ). In other words, the greater the RT, the more will be the agility and vice versa. The results of this study are parallel to other researches in this field and a meaningful relation between agility and showing reaction to a stimulant.

Young, McDowel, and Scarlett (2001) explain agility as the shifting action in various sports, starting an action, chasing or escaping the opponent, moving ball with a ball, stopping skills and showing reaction. Equally, the performance of agility could be defined as a response to a stimulant and for that a relation between agility and reaction is considered.

Baruwal (1983) suggested that RT could be related to *physical activity* patterns and to the athletic training degree. They found that sportsmen high level and athletes normally had shorter RT than non-athletes and continuous participation in sports at higher level did reduce RT. Also team game players had quicker RT than others. The abilities to perceive the meaning of a stimulus, react correctly and to move to the required spot within less time are of vital importance in handball, basketball, volleyball, tennis, football, etc.

On the other hand, the results of Akarsu, Çaliskan, and Dane (2009) support the view that exercise is beneficial to eye-hand reaction time and visuo-spatial intelligence. Their findings showed that Athletes have faster eye-hand visual reaction times and higher scores on visuo-spatial intelligence than non-athletes. In addition, it can be stated that all sports are beneficial for the enhancement of cognitive function (Colcombe & Kramer, 2003), because there was not any difference among different sports mentioned in this study such as soccer, basketball, volleyball, running, and skiing.

Çömük and Erdem (2010), in their study on agility and reaction scores on ice-skaters determined that children playing sports had better reactions and agility and athletes with better reaction times were also getting high agility scores. The same findings were observed by and Ölçücü (2007) in his study on the factors affecting the development of tennis playing skills on 10 to 14 year old children.

The study of Büyükipekçi and Taşkın (2011) where the change on RT, agility and anaerobic performance of female volleyball players was researched, they emphasized how important RT was on the action the players made instantly both in defense and offence and how important agility was to be able to move the whole body rapidly and correctly. Besides, the study demonstrated that players with good reactions had developed agility features, too.

To explain the RT in terms of motor control, researchers assume that there are three stages in information processing. The first stage concerns the stimulus identification in response to sensory inputs. When this stage is completed, information is passed to the response selection stage and finally to the third stage, response programming, until an action (output) occurs (Schmidt & Wrisberg, 2004). Several sources of stimuli such as a flying ball or court illumination may influence a player's information processing time. The time cost associated with each of these three stages determines the length of the RT.

#### 5. CONCLUSION

The results from this study demonstrated that although there were some limitations, the RT revealed acceptable reliability and validity for field sport testing. The significant relationships observed between IAT and RT provides evidence to support the view that RT can detect moderate performance changes in change-of-direction speed in field sport athletes. The coaches could



use the measurement of RT as an important indicator in predicting Illinois agility performance in football players.

## 6. REFERENCES

1. Akarsu Sedi, Çaliskan Erkan, & Dane Şenol. (2009) Athletes have faster eye-hand visual reaction times and higher scores on visuospatial intelligence than nonathletes. *Turkish Journal of Medical Sciences*, 39 (6), 871-874.
2. Baruwal H.B. (1983). Significance of some facts on reaction time in sports. *Vyayam Vidnyan*, 16 (4), Nov (3-7),
3. Bloomfield, J., Polman, R. & O'donoghue, P. (2007). Physical demands of different positions in FA Premier League soccer. *Journal of Sports Science and Medicine* 6, p. 63-70.
4. Buttifant, D., K. Graham & K. Cross. (1999). Agility and speed of soccer players are two different performance parameters. *Journal of Sports Sciences* 17, 809.
5. Büyükippekçi, S., & Taşkın, H., (2011). Bayan Voleybolcularda Reaksiyon Zamanı, Çeviklik ve Anaerobik Performanstaki Değişimlerin Sezon Süresince İncelenmesi. Konya: Selçuk Üniversitesi Beden Eğitimi ve Spor Bilimleri Dergisi,13(1), 20–25.
6. Colcombe S, & Kramer AF. (2003). Fitness effects on the cognitive function of older adults: A meta-analytical study. *Psychological Science*, 14, p. 125-130.
7. Çömük, N., & Erden, Z. (2010). Artistik buz pateninde üçlü sıçrayış performansının çeviklik ve reaksiyon zamanı ile ilişkisi. *Fizyoterapi Rehabilitasyon*, 21(2), 75-8.
8. Cronin, J. B., & Hansen, K. T. (2005). Strength and power predictors of sports speed. *Journal of Strength and Conditioning Research*, 19, p. 349 – 357.
9. Docherty, D.,H.A. Wenger, and P. Neary. (1988). Time-motion analysis related to the physiological demands of rugby. *Journal of Human Movement Studies*, 14, p. 269-277.
10. Gabbett T, Kelly J, Ralph S, & Driscoll D. (2009). Physiological and anthropometric characteristics of junior elite and sub-elite rugby league players , with special reference to starters and non-starters. *The Journal of Science and Medicine in Sport*, 12, p. 215–222.
11. Gabbett, T.J., Kelly, J.N. and Sheppard, J.M. (2008) Speed, change of direction speed, and reactive agility of rugby league players. *Journal of Strength and Conditioning Research*, 22, 174-181.
12. Leone, M., Lariviere, G., & Comtois, A. S. (2002). Discriminant analysis of anthropometric and biomotor variables among elite adolescent female athletes in four sports. *Journal of Sports Sciences*, 20, 443 – 449.
13. Lin, Q.H. (2001) Programming for Motor Control. Taipei: Wen Shi Zhe.
14. Little, T., & Williams, A. G. (2005). Specificity of acceleration, maximum speed, and agility in professional soccer players. *Journal of Strength and Conditioning Research*, 19, 76 – 78.
15. Magill, R.A. (2007). Motor learning and control: concepts and applications. (8th ed.). *McGraw-Hill*, New York.
16. Ölçücü, B., (2007). 10-14 yaş çocuklarda tenis becerisinin gelişimine etki eden faktörlerin değerlendirilmesi. Yüksek Lisans Tezi, Sivas: C.Ü. Sağlık Bilimleri Enstitüsü.
17. Pauole, K., K. Madole, & M. Lacourse. (2000). Reliability and validity of the T-test as a measure of agility, leg power and leg speed in college aged men and women. *Journal of Strength and Conditioning Research*, 14, p. 443-450.
18. Pyne, D. B., Gardner, A. S., Sheehan, K., & Hopkins, W. G. (2005). Fitness testing and career progression in AFL football. *Journal of Science and Medicine in Sport*, 8, p. 321 – 332.
19. Reilly T, Williams AM, Nevill A, & Franks A. (2000). A multidisciplinary approach to talent identification in soccer. *Journal of Sports Sciences*, 18, p. 695–702.
20. Roozen, M. (2004). Illinois agility test. *NSCA's Performance Training Journal* 3(5), 5-6.
21. Ruijter, J., Lorist, M. M., & Snel, J. (2000). The effects of caffeine on visual selective attention to color: An ERP study. *Psychophysiology*, 37, p. 427-439.
22. Schmidt, R.A., & Wrisberg, C.A. (2004). Motor learning and performance (3rd ed.). Champaign, IL: Human Kinetics Publishers.
23. Sheppard, J.M., Young, W.B., Doyle, T.L., Sheppard, T.A. & Newton, R.U. (2006). An evaluation of a new test of reactive agility and its relationship to sprint speed and change of direction speed. *Journal of Science and Medicine in Sport*, 9, p. 342-349.
24. Shim, J., Chow, J.W., Carlton, L.G. & Chae, W.-S. (2005). The use of anticipatory visual cues by highly skilled tennis players. *Journal of Motor Behavior*, 37(2), 164-175.
25. Silva JR, Magalhães JE, Ascensão AA, Oliveira EM, Seabra AF, & Rebelo AN. J (2011). *Strength and Conditioning Research*, 25(10), 2729-39.
26. Spencer, M., Bishop, D., Dawson, B. & Goodman, C. (2005). Physiological and metabolic responses of repeated-sprint activities: specific to field-based team sports. *Sports Medicine* 35, p. 1025-1044.
27. Vescovi J.D., & McGuigan M.R. (2007). Relationships between sprinting, agility and hump ability in female athletes. *Journal of Sports Sciences*, p. 1-11, iFirst article.
28. Vescovi, J. D., Murray, T. M., & VanHeest, J. L. (2006). Physical and physiological characteristics of elite National Hockey League prospects. *International Journal of Sports Physiology and Performance*, 1, p. 84 – 94.

29. Young, W.B., McDowel, M.H., & Scarlett, B.J., (2001). Specificity of sprint and agility training methods. Australia: *School of Human Movement and Sport Sciences*, University of Ballarat, Victoria.
30. Young, W.B., M. Hawken & L. McDonald. (1996). Relationship between speed, agility, and strength qualities in Australian rules football. *Strength and conditioning coaches*, 4(4), 3-6.

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# ROBOT ENHANCED THERAPY FOR IMPAIRED UPPER EXTREMITIES FUNCTIONS IN HEMIPLEGIC CHILDREN

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## Abstract

**Objective:** Studying the effect of Robot Enhanced Therapy on hemiplegic children. Thirty six spastic hemiplegic children were selected from comprehensive rehabilitation center in Najran, ranged in age from nine to twelve years old divided randomly into two matched groups. The control group received the selected program for correcting upper limb in addition to occupational therapy, while the study group received the same selected program for correcting upper limb pathomechanics in addition to robot enhanced therapy. Both groups received treatment for one hour three times weekly for three successive months. Maximum hand grip strength, shoulder range of motion and grasping age equivalent were measured for both groups before and after intervention. **Results:** There was significant improvement in all the measuring variables for both groups in favor for study group.

**Conclusions:** Robot assisted and computer enhanced hand therapy is an effective and promising method of hand function rehabilitation in hemiplegic children.

**KEYWORDS:** Hemiplegic Children. Occupational Therapy. Robotic Therapy.

## 1. INTRODUCTION

Hemiplegic cerebral palsy (CP) children account 30% of CP children<sup>1</sup>, characterized by affected arm and leg on one side of the body<sup>2</sup>. Hemiplegic children had difficulties in performing fine motor hand activities and had abnormal upper limb posturing during gait and in any activities required effort<sup>3</sup>. Combination of spasticity, weakness, and sensory and motor control deficits reduced functional abilities of the upper limb and resulting in children becoming one handed experts, the affected limb acting as a stabilizing or helper hand during everyday activities<sup>4</sup>.

Hand function deficits in hemiplegic children are a major cause of disability<sup>5</sup>. The child hold the arm in fixed postures, either extended or flexed during walking, and had clumsy, reciprocating, swinging arm movements or hold both arms flexed at the elbows. Affected children may extend their arms, pronate their hands, and clench their fists during running<sup>6</sup>.

Robot therapy has emerged in the last few decades to relearn patients with neurological injuries to motor tasks and improving their quality of life. Pediatric robotics is an arm orthosis with a spring mechanism for adjusting arm weight support, it supported functional therapy in children at the age of 4-12 years who had restricted function in their upper extremities<sup>7</sup>. Robotic therapy devices can automate the repetitive and strenuous aspects of conventional physical therapy and serve as scientific instruments for quantifying the recovery process<sup>8</sup>.

Exoskeleton robotized prosthesis designed to match and align their mechanical joints to human limb joints, in order to achieve articular decoupling and a good coverage of the whole arm range of motion (ROM) <sup>9</sup>. Robot assisted therapy was more effective in treatment of the upper extremity than, conventional therapy<sup>10</sup>. Robots are strong enough to complete movements when patients are completely impaired or when tone and spasticity act in opposition<sup>11</sup>. Robotic therapy encouraged motor recovery<sup>12</sup>, improved movement in completely impaired patient<sup>13</sup>, increased motor-plasticity during rehabilitation therapy<sup>14, 15</sup>.

The field of pediatric neurorehabilitation had rapidly evolved with the technological advancements. Rehabilitation robotics and computer-assisted systems complemented conventional physiotherapy and occupational therapy techniques, these systems appear promising in children. Despite large acceptance by the children and parents a few therapy systems have been evaluated in children, and there is lack of well-designed randomized controlled studies<sup>16</sup>.

## 2. MATERIAL AND METHODS

The study is a randomized controlled trial, the study procedures performed according to the ethical standards and after approval of the children families. The study performed over the period from March 2014 to November 2014.

**Subjects:** Thirty six spastic hemiplegic CP children of both genders, were selected from the Comprehensive rehabilitation center in Najran, The children were classified into blocks according to their severity. Then, with each block subject are randomly assigned to control and study groups to ensure that each treatment condition has equal proportion for control and study group Table (1). All children ranged in age from nine to twelve years old, had grade 1 or 1<sup>+</sup> according to modified ashworth scale and grade II or III according to Manual Ability Classification Scale (MACS), All children can follow orders and had neither auditory nor visual disorders. Children were excluded if they had fixed contracture and deformity, surgical intervention as: muscle transfer and



variables ( $p < 0.05$ ). post treatment comparison for both groups showed significant improvement for the study group ( $p < 0.05$ ) as illustrated in table (3) and Fig (4,5,6,7).

**Table (3): Comparison between both groups in all measured variables.**

Variable	Time	Control group $\bar{X} \pm SD$	Study group $\bar{X} \pm SD$	P- value	S.D Error
Hand grip strength	Pre	9.42± 2.34	9.85± 2.41	0.89**	0.62
	Post	12.5±1.99	16.9 ±1.5	0.001*	0.72
	P- value	0.001*	0.001*		
	Standard error	0.63	0.39		
Shoulder abduction ROM	Pre	71±15	73±13	0.7**	0.158
	Post	82±11	91.5±9	0.001*	0.207
	P- value	0.001*	0.001*		
	Standard error	0.110	0.109		
Shoulder flexion ROM	Pre	63±6	61±8	0.18**	0.123
	Post	71±5	80±7	0.001*	0.105
	P- value	0.001*	0.001*		
	Standard error	0.149	0.121		
Age equivalent of grasping	Pre	12.64 ±2.7	13.57±2.59	0.54**	.64
	Post	19.78±3.2	25.14±4.1	0.001*	0.69
	P- value	0.001*	0.001*		
	Standard error	0.7	0.8		

$\bar{X} \pm SD$ : mean± standard deviation p: level of significant \*: significant \*\*: non significant

#### 4. DISCUSSION

Hemiplegic children suffered from upper extremities muscle weakness, spasticity, limited ROM, muscle tightness and abnormal mechanics hindering the children functional activities. The goal of habilitation in hemiplegic children is to improve independence in activities of daily living and reduce family care. Habilitation success depends on the intensity of therapy, repetition, and a goal-oriented and task-specific training program for achieving required executive motor function. The habilitation programs constructed to met the special needs of hemiplegic children. The traditional individual treatment sessions were expensive and limited resources hinder the achievement of optimal therapy and limit the dosages of habilitation sessions, the robotic therapy have been developed to overcome this problems and met the requirements of sensory motor learning.

The purpose of the current study was to investigate the effect of robot enhanced therapy on upper extremities function abilities in hemiplegic children concerning the proximal and distal control and hand function activities. Shoulder range of motion used as indicator of increase proximal motor control, hand grip strength used as indicators of distal motor control and the PDMS-2 used to measure function gain in upper extremities.

The study group showed significant improvement in hand grip strength, shoulder ROM and age equivalent after intervention this could be attributed to robot assisted therapy provides motivation and entertainment for children and revealed any remaining motor function abilities, children can benefit from highly intensive, repetitive, self-initiated movement therapy. The robots act as exoskeleton align upper extremities with anatomical axes providing weight support for affected extremities helping the child to overcome gravity and spasticity together with augmented feedback and enabling self-directed learning allowing the child to gain more proximal and distal motor control and increasing function ability. The robot provides any level of movement assistance and gravity compensation and improved shoulder ROM<sup>17</sup>. Hand exoskeleton rehabilitation robot improved hand grip strength<sup>18</sup>.

Robotic finger motivated patient with an engaging game environment that challenges individuated control of the fingers, automatically control assistance levels, and quantify finger individuation after stroke<sup>19</sup>. Robot assisted individuals with neurological disorders to independently drink from a glass<sup>20</sup>. Fasoli et al.<sup>21</sup> demonstrated robot therapy improved quality of upper extremity test and the upper extremity Fugl-Meyer assessment scores<sup>22,23</sup>. Hesse et.al.<sup>24</sup> demonstrated improvement on pronation, supination and wrist flexion and extension ROM in patients with stroke. Systematic review confirms the potential for robotic assisted devices to elicit improvements in proximal upper limb function<sup>25</sup>.

Improvement after intervention may be attributed to motivation and active participation of the children in an enriched environment play a fundamental role in the sensory motor learning as CP children were appear to be less motivated and had difficulty to remain motivated for prolonged motor habilitation program<sup>26,27</sup>. Research had shown that simply imagining movement of a limb activates the same regions of the motor cortex as actually performing the movement<sup>28</sup>. Mental practice alone can produce functional improvement<sup>29</sup>. Motivating training programs allowed prolonged rehabilitation and reduce the cost with high qualitatively and intensive level of training <sup>30</sup>. Augmented feedback during a vasomotor tracking task induced region-specific changes in frequency



dependent power, interestingly, there was also increases in functional connectivity between cortical regions involved in the motor task<sup>31</sup>.

The more practice and repetition are key components of training which lead to more sensory input, feedback and permanent changes as new strategies and motor plan produced lead to learning a new skill or restore the lost skill. The nervous system provide sensory processing for perception of body orientation in space provided by visual, vestibular, and somatosensory systems, sensory motor integration essential for linking sensation to motor responses. Robotic therapy foster somatosensory stimulation that induces brain plasticity<sup>32</sup>. Recent work has demonstrated that robot make changes in the electroencephalogram activity in neural cortical circuits and modulated contralateral alpha and beta frequency power in cortical areas<sup>33</sup>. Neuroplasticity is considered to be the underlying mechanism by progressive, challenging motor skill learning rather than merely repetitive motor tasks. Active voluntary motor skill learning leads to more prominent increases in activity in contralateral primary motor cortex, motor excitability recruitment curves, and intracortical facilitation<sup>34</sup>.

## 5. CONCLUSION

Robot assisted and computer enhanced hand therapy is an effective and promising method of hand function rehabilitation in hemiplegic children, it improved proximal and distal control in the upper extremities and hand function.

### List of abbreviations:

MACS	Manual Ability Classification Scale
CP	Cerebral palsy
PDMS-2	Peabody developmental motor scale
ROM	Range of motion
SPSS	statistical package for social studies

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## 6. REFERENCES

- 1- Colver AF, Sethumadhavan T. The term diplegia should be abandoned. *Arch Dis Child.* 2003;88:286-290.
- 2- Sankar, C, Mundkur, N. Cerebral palsy-definition, classification, etiology and early diagnosis. *Indian J Pediatr.*2005;72(10):865-868.
- 3- Boyd RN, Morris ME, Graham HK. Management of upper limb dysfunction in children with cerebral palsy: a systematic review. *Eur J Neurol.* 2001;8(5):150-166.
- 4- Gordon AM, Lewis SR, Eliasson AC, Duff SV. Object release under varying task constraints in children with hemiplegic cerebral palsy. *Dev Med Child Neurol.*2003;45:240-248.
- 5- Pagliano E, Andreucci E, Bono R, Semorile C, Brollo L, Fedrizzi E. Evolution of upper limb function in children with congenital hemiplegia. *Neurol Sci.*200;22(5):371-375.
- 6- Swaiman KF, Russman BS. Cerebral palsy. In; Ashwal S. *Pediatric neurology.* 3<sup>rd</sup> ed., Mosby.Philadelphia.1999;312-315.
- 7- Pathak Y and Johnson M. An upper limb robot model of children limb for cerebral palsy neurorehabilitation. *Conf Proc IEEE Eng Med Biol Soc.* 2012;2012:1936-1939.
- 8- Malosio M, Pedrocchi N, Vicentini F, Tosacchi LM. Analysis of elbow joint misalignment in upper limb exoskeleton. *IEEE International Conference on Rehabilitation Robotics (ICORR).* 2011;1-6.
- 9- Platz T. Evidence-based arm rehabilitation - a systematic review of the literature. *Nervenarzt.* 2003;74(10):841-849.
- 10- Fasoli SE, Ladenheim B, Mast J, Krebs HI. New horizons for robot-assisted therapy in pediatrics. *Am J Phys Med Rehabil.*2012;91(11):280-289
- 11- Van der Lee JH, Snels IAK, Beckerman H, Lankhorst GJ, Wagenaar RC, Bouter LM. Exercise therapy for arm function in stroke patients: a systematic review of randomized controlled trials. *Clin Rehabil.*2001;15(1):20-31.
- 12- Wolbrecht ET, Chan V, Reinkensmeyer DJ, Bobrow JE. Optimizing compliant, modelbased robotic assistance to promote neurorehabilitation. *Neural Syst Rehab Eng, IEEE Trans.* 2008;16(3):286-297.
- 13- Israel JF, Campbell DD, Kahn JH, Hornby TG. Metabolic costs and muscle activity patterns during robotic-and therapist-assisted treadmill walking in individuals with incomplete spinal cord injury. *Phys Ther.* 2006; 86:1466-1487.
- 14- Kaelin-Lang A, Sawaki L, Cohen LG. Role of voluntary drive in encoding an elementary motor memory. *J Neurophysiol.* 2005;93(2):1099-1103.
- 15- Marchal-Crespo L, Reinkensmeyer DJ: Review of control strategies for robotic movement training after neurologic injury. *J Neuroeng Rehab.* 2009; 6:20.
- 16- Meyer-Heim A, van Hedel HJ. Robot-assisted and computer-enhanced therapies for children with cerebral palsy: current state and clinical implementation. *Semin Pediatr Neurol.* 2013;20(2):139-145.

- 17- Ball, S.J.; Brown, I.E.; Scott, S.H., "MEDARM: a rehabilitation robot with 5DOF at the shoulder complex," Advanced intelligent mechatronics, 2007 IEEE/ASME international conference .1:6, 4-7.
- 18- Godfrey SB, Holley RJ, Lum PS. Clinical effects of using HEXORR (Hand Exoskeleton Rehabilitation Robot) for movement therapy in stroke rehabilitation. *Am J Phys Med Rehabil.* 2013;92(11):947-958.
- 19- Taheri H, Rowe JB, Gardner D, Chan V, Gray K, Bower C, Reinkensmeyer DJ, Wolbrecht ET. Design and preliminary evaluation of the FINGER rehabilitation robot: controlling challenge and quantifying finger individuation during musical computer game play. *J Neuroeng Rehabil.* 2014;4;11:10.
- 20- Looned R, Webb J, Xiao ZG, Menon C. Assisting drinking with an affordable BCI-controlled wearable robot and electrical stimulation: a preliminary investigation. *J Neuroeng Rehabil.* 2014;7;11:51
- 21- Fasoli SE, Fragala-Pinkham M, Hughes R, Krebs HI, Hogan N, Stein J. Robotic therapy and botulinum toxin type A: A novel intervention approach for cerebral palsy. *American Journal of Physical Medicine and Rehabilitation* 2008;7:89-97.
- 22- Sveistrup H: Motor rehabilitation using virtual reality. *J Neuroeng Rehabil.*2004; 10;1(1):10.
- 23- Sandlund M, McDonough S, Häger-Ross C. Interactive computer play in rehabilitation of children with sensorimotor disorders: A systematic review. *Dev Med Child Neurol.*2009; 51:173-179.
- 24- Hesse S, Schmidt H, Werner C, Bardeleben A. Upper and lower extremity robotic devices for rehabilitation and for studying motor control. *Curr Opin Neurol* 2003;16:705-710.
- 25- Kwakkel G, Kollen BJ, Krebs HI. Effects of robot-assisted therapy on upper limb recovery after stroke: a systematic review. *Neurorehabil Neural Repair.* 2008;22(2):111-121.
- 26- Jennings KD, Connors RE, Stegman CE. Does a physical handicap alter the development of mastery motivation during the preschool years? *J Am Acad Child Adolesc Psychiatry.*1988; 27:312-317.
- 27- Messier J, Ferland F, Majnemer A: Play behavior of school age children with intellectual disability: Their capacities, interests and attitude. *J Dev Phys Disabil.*2008; 20:193-207.
- 28- Schaechter JD: Motor rehabilitation and brain plasticity after hemiparetic stroke. *Prog Neurobiol* 2004, 73:61.17.
- 29- Prasad G, Herman P, Coyle D, McDonough S, Crosbie J: Using motor imagery based brain-computer interface for post-stroke rehabilitation. Antalya, Turkey: Neural Engineering; 2009. NER'09. 4th International IEEE/EMBS Conference on. IEEE, 2009.
- 30- Majnemer A, Shevell M, Law M, Poulin C, Rosenbaum P. Level of motivation in mastering challenging tasks in children with cerebral palsy. *Dev Med Child Neurol.*2010;52(12):1120-1126.
- 31- Lin CL, Shaw FZ, Young KY, Lin CT, Jung TP. EEG correlates of haptic feedback in a visuomotor tracking task. *Neuroimage.* 2012;60:2258-2273.
- 32- Rossini PM, Dal Forno G: Integrated technology for evaluation of brain function and neural plasticity. *Phys Med Rehabil Clin N Am* 2004, 15:263–306.
- 33- Formaggio E, Storti SF, Galazzo IB, Gandolfi M, Geroi C, Smania N, et al. Modulation of event-related desynchronization in robot-assisted hand performance: brain oscillatory changes in active, passive and imagined movements. *J Neuroeng Rehabil.* 2013;10:24.

## 7. APPENDAGES



**Fig (1): Electronic Hand-held Dynamometer**



**Fig (2): Inclinometer**



Fig (3): Armeo Spring pediatric programs

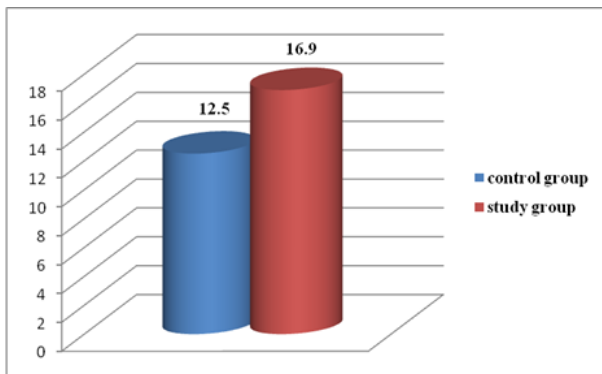


Fig (4): post treatment comparison between both groups in hand grip strength

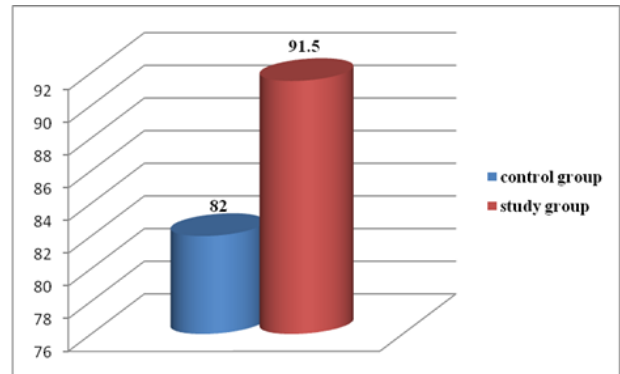


Fig (5): Post treatment comparison between both groups in shoulder abduction ROM.

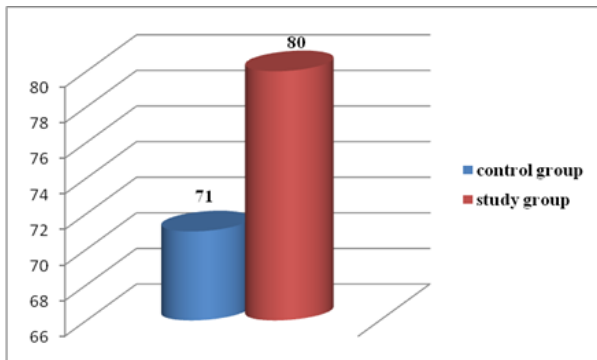


Fig (6): Post treatment comparison between both groups in shoulder flexion ROM.

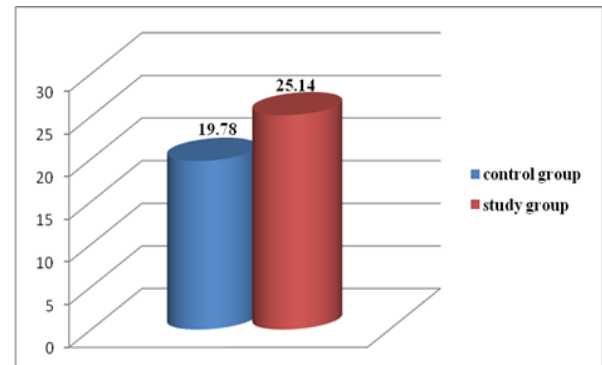


Fig (7): Post treatment comparison between both groups in grasping age equivalent.

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# THE DESIGN OF THE ISSEP TUNISIAN TEACHERS ABOUT THE LMD REFORM (CASE: ISSEP TEACHERS OF SFAX)

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## Abstract

This article focuses on the analysis of the conceptions of the teacher trainers in Tunisian ISSEP about the LMD reform (case of the teachers of ISSEP From Sfax). The analysis of the corpus studied through the used methodological tool (semi-structured interviews) showed that (93% of them say they have not received any training or information regarding the LMD) (85% of them also claim that they have never been associated with the reform). (89 % say they teach as they used before the reform). (97 % of teachers report that they always use the summative evaluation). When asked to summarize the LMD reform in four key points (92 % of respondents are unable to summarize the actual reform). Moreover, (81 % of respondents reported being unable to characterize the LMD and its new educational reform inputs).

**KEYWORDS: Reform LMD. LMD objectives. Conception of teaching practices.**

## 1. INTRODUCTION

The LMD reform requires a contextual logic and dynamics of evolution depending on the acceptance and understanding of the reform of its meaning, its objectives and its goals by stakeholders. Research "Curriculum Teaching" tends to respond to the multifaceted demand for expertise in teaching, education and training. The expertise does not necessarily reside in the possession of solutions and the production of evidence, but above all in the knowledge of conceptions of teachers to be able to analyze the teaching and progress in training issues. In order to analyze the design of teachers, and to do that we administered a semi-structured interview to 9 teachers working in ISSEP Sfax maintenance. Apriori, we assume that university instructors Tunisian ISSEP do not have a sufficiently clear and detailed design of the LMD reform, its objectives, or design of teaching practices which will be the subject of our conceptual framework.

### Conceptual Framework:

#### 1. LMD REFORM

"Any reform tends to return to restructuring in a form already installed. Its main feature is to be a form imposed and non-negotiable, his firmness and closing is related to the establishment of a text defining the changes to be made." (Cross, p 84)

Curriculum reform in general (education, or university) will not be recognized after defining its specific objective, its methods and its evaluation and monitoring criteria. It would be superfluous to systematically bring objections and rejections that may arise reforms, the only refusal of actors, renunciation, their fears of adventure or their conservatism and attachment to inaction. This stigma can stifle the real issues at a reform, especially as it risks turning the consultations on a debates deaf and precipitating the resignation and disengagement of the actors. A reform that cannot base a new representations, new practices and new perspectives would be a waste of time and waste of energy and resources.

#### 2. Objectives of the LMD system

The LMD system in high education has some objectives which can be summarized in the following points:

- The Organization of the training offer in the coherent form sets of teaching units organizing an adapted teaching progressions in order to set up all national diploms.
- The integration, of multidisciplinary, as appropriate approaches and facilitating the improvement of educational quality, information, guidance and coaching of the student.
- The development of professional higher education, certificate training needs and favorit the recognition of priory experience in relation to the economic and social backgrounds.
- Encouraging the mobility, increasing the attractiveness of training at national and international level, and give the possibility of validation of training periods.
- The Integration of learning "soft skills" such as mastering foreign languages and the software tools.
- The Facilitating of the creation of teachings by methods based on information technology and communication and the development of distance education.

#### 3. The design of teaching practices:



By practicing teaching we imply, all the teacher's activities in the classroom. It is an actment designs (discipline, education, disciplinary skills). All what said and done by the teacher in the classroom, taking into account its preparation, its concepts and knowledge and its instant decisions.

Teaching practices include also technical, gestures (gestes). Because there is a link between the thinking of teachers and the way they teach. This link has a characteristic of reciprocity. Teachers' conceptions influence the organization of their courses, their teaching practices influence their designs.

That's why the knowledge of the teacher designs, can analyze the educational problems in order to progress the training.

The mission of the history of science and epistemology is to encourage reflection on their practices, their evolution and their foundations. Kember, (1997) noted that the terms are sometimes used interchangeably and include conceptions, beliefs, approaches or intentions. According to the work done by Langevin et al (2007), we have retained a sense of design as a mental attitude, the result of previous experience.

Any description of teaching practices implies a way of thinking, the way of conceptualizing and better than that the mode of their configuration.

## 2. MATERIAL AND METHODS

Qualitative research typically focuses "on the statements and actions of a person involved in a specific context. Although it is possible to collect purely individual for example through interviews, observations, or recorded discourse analysis" (Huberman and Miles, 1991, p161).

If the study sample (nine cases) is not representative of the population of trainers (ISSEP in Tunisia), it may nevertheless allow us to characterize the designs of the teachers ISSEP of the LMD reform, currently widespread in all higher education institutions in Tunisia.

To validate this study, we used a semi-structured interview below :

1 / Have you been associated with the LMD reform?

2 / Can you sum up the LMD in four sentences?

3 / pedagogically , what the LMD brings back? Do you personally have changed your teaching following the LMD reform?

4 / The LMD text tells us that we have to teach otherwise, Student have to Learn differently ... ..and Assessing otherwise ... what do you conclude?

5- Do you changed your evaluation way ?

Our semi - directive interview is part of the information gathering part, insofar as our case study are expected to provide answers to questions prepared in advance and planned in a specific order. A semi-structured interview is identified by the presence of two characteristics:

- The production of the part of the interviewee a discourse that is not linear, which means that the interviewer have more freedom to explain his point of view.

- The semi-directive interview is directional part (at themes, objects on which you want to collect information) and non-directive part (within the themes). It has two main advantages:

- The information that you want to collect better reflect the representations in a structured interview, as the interviewee has more freedom in how to express themselves.

- The informations to collect in a shorter time can be more efficient than in a free maintenance.

We also recall that this interview technique or by oral interview questions or interview answers orally and simultaneously we transcribe the answers for evaluation later seems effective and consistent with the framework of qualitative research moment that our sample is based on a random selection process without specific well defined but people meet the objective of the research.

Each interview was conducted in a room where there was the teacher trainer and researcher. The interviews were semi-structured. This technique has the advantage of allowing the production of linear address to moderate inference where interactions with teachers are guided and structured by a few landmarks to collect good quality information-oriented objectives pursued.

### Content analysis

In very simple terms, the content analysis is a technique that is commonly used to identify the message in a text or an image. It aims to exceed the Impressionist reading, intuitive and subjective content; that being so, then requires the implementation of a set of rules governing the scan operation. These rules, when applied by other people in the same way, must lead to the same conclusions.



The literature on this technique informs us that there are three methods of content analysis:

- Logical-aesthetic methods: they are interested in text structures in dealing with the effects of meaning (Mucchielli 1988). It's "discourse analysis to find out the style, vocabulary, figures of speech, the usual methods, and the structural analysis of a text or a series of interactions, looking for ... transformations of information in order to "make sensational", etc. ... "(Mucchielli, 1988 p.27)
- Logical-semantic methods: they focus on the clarification of semantic values of content and logic ranking. For example, Mucchielli (1988) cites "the identification and keywords of a text or a book (index) ... the summary or condensation of an article or book ... inventory, categorization and classification of responses to an open question ... trend analysis of an article or newspaper and comparison of trends ... "(Ibid., p.37) .
- Semantic methods: they are fundamentally concerned with "the search for meanings and connotations of a word or series of words ... research themes of a story ... the description, definition of" universe "particular individual or cultural after texts ..." (Ibid., p.37).

We present below the picture of the size of our sample study.

**Table 1: Size of the study sample**

Code of the teacher	grade	Specialty
<u>A. Case. 1</u>	Assistant	Didactic
<u>A. Case. 2</u>	Assistant	Psychology Assistant
<u>A. Case. 3</u>	Assistant	Assistant Theory of Physical Education and Sport (TEPS)
<u>A. Case. 4</u>	Assistant	Physiology Assistant
<u>M.A. Case .1</u>	Master Assistant	psychophysiological
<u>M.A. Case .2</u>	Master Assistant	Master Didactic of physical and sporting activities
<u>M.A. Case .3</u>	Master Assistant	Psychology
<u>M.A. Case .4</u>	Master Assistant	Physical Activity adapted (MPA)
<u>M.A. Case .5</u>	Master Assistant	Physiology assistant

A = Assistant

M.A= Master-Assistant

### 3. RESULTS AND DISCUSSION

Our aim in this study is to characterize the designs of teachers ISSEP about the LMD reform, now widespread in all institutions of high education. The responses are given in the following table.

**Table 2: Breakdown of responses from the study sample.**

Questions	Answers
Have you been involved in the LMD reform?	85% of respondents answered (I Do Not)
<u>Information / Training</u>	93% no answer
Summarize the reform in 4 points	92% of (SI) are unable to summarize in a few sentences the LMD reform, proof that they have not assimilated
What does the reform pedagogically?	81% of (SI) remain unable to characterize pedagogical reform LMD and it's contributions
Otherwise teach / learn	89% of (SI) say they continue to teach as before (knowledge transfer). Their students follow and learn by heart the lessons.
Did you change in valuation method?	97% of IT say they are still in the summative evaluation (knowledge tests, restitution exams ...)
Will it resistant to the LMD reform for teachers?	79% of SI claim resist this reform is not made for our university system, according to some of them.

SI= Subjects Interviewed

Most of the teachers surveyed said they had not been informed, let alone trained in LMD reform. (93% of them say they have not received any training or information about the LMD), 85% of them also say they never have to be associated with the reform.

- **A. Case .1:** "Unfortunately I was not involved there were instructions to apply the procedures of an integral manner"
- **A. Case 2:** it has been requested the establishment "Yes I participated in the implementation of programs, but at my specialty has not changed much. All what we did four year program was condensed to three years. "
- **A. Case.3:** "Unfortunately, I was not associated with BMD system, I have not been invited,"
- **A. Case.4** "In France. I attended three training seminars in LMD"
- **MA. CAS.1** "Yes I participated as department head and teacher at the ISSEP (but only one meeting)

-**MA.Case. 2** "At the introduction of the contents of the first stage (preparatory phase) but there were only 2 teachers out of 112 teachers."

- **MA.Case. 3** "I attended one-day seminar where I was involved relatively" one sitting is almost negligible.

- **MA.Case.4** "I was not associated neither in meetings, nor in the few seminars on this issue."

This reform seems to have been conducted top-down by the Ministry of High Education:

-**MA.case.5** « Unfortunately, the decisions makers have proposed their own projects, regardless of the one proposed by small reflections cells » (89% say they teach as before the reform).

-**MA. Case.2** states that "The Tunisian student cannot learn otherwise. He is content of the course instructors, it is not accustomed or trained to seek advantage and go beyond the current received. I have not changed my assessment system ... I am very pessimistic there is a lot of things to see. It is not yet the page to use the tutoring, there is also a lack of mobility. »

As a result, their evaluation methods have not changed much and summative evaluation continues to be their favorite technique. (97% of teachers say they always use the summative evaluation).

When they been asked to summarize the LMD reform in four points, 92% of those interviewed are unable to sum up the so-called reform. Furthermore, 81% of respondents reported being unable to characterize the LMD reform and new teaching contributions.

- **A.case.1** "The LMD reform was designed to Western European countries. In Tunisia we meet many difficulties and this for two reasons:

- The first is the lack of materials, equipment, and infrastructure.

- The Second one concern the lack of human resources as well we need perseverance to make this program successful. »

Summarizing the LMD system in four sentences the subject:

- **MA.Case.3** states that "The availability of time is a great handicap .J'enseigne as usual. Depending on the pace of the students.

On student learning differently "MA.cas.3 answers" I think only 10% want to learn and get involved to be informed more courses taught by trainers. 90% are not interested. .Regarding Component of the evaluation, a problem of availability of time, we simply control instead of two. The degree of absenteeism is high. The texts are not clear, a mismatch between the circular; and application.»

For its part, MA.cas.4 adds that "The LMD is an Anglo-Saxon system to allow the student d`être self .... Does the Tunisian student is able to do this? ... The LMD decreased dramatically the content of the training"

-**MA.Case.5** "Pedagogically, my behavior is always the same. ... My learning education system has not changed ... I have not changed my evaluation mode. »

No wonder, either, that 79% of them try to resist this reform imposed on them, because even if it is purely formal (semesters, introduction of credits, course: 3, 5, 8) it disrupts their teaching habits.

The results of the interview on the design are the teachers of the LMD reform show that:

Teachers surveyed do not have a clear conception of the LMD reform, including its educational component.

This can be explained by:

- The lack of association with the reform of teachers.

- Lack of information on reform.

- Lack of training for reform.

The teachers interviewed did not have a clear and thorough understanding of LMD reform.

Encourage bottom-up initiatives on the part of faculty members, place in a conducive learning environment and education provide effective support and stimulate reflection on the role of education in the process of learning, are promising lines of development for the quality of education. (Hénard, 2010) Despite some resistance, there is minimal changes in teaching practices among teachers by introducing active methods (project teaching and learning through problems, use of digital technologies).

Every teacher, whether new or experienced should consider offering courses tailored media based on a systemic approach of the LMD system. These courses must face the expectations of students and meet both the requirements of a vocationally contextualised training to a degree of magnitude that can facilitate their integration into the labor market.

Work on employability show that the priorities, attitudes, and interests of teachers (in general) evolve with their career phases (Huberman, 1989). Support the needs peer through educational meetings, by training activities, through investment in educational materials.

The quality of university education evolves with career phases, from the point of view of the teacher identity as from the point of view of possible changes in the distribution of interest between research and teaching.

In terms of consequences, following the results of our research. It is time to think really to begin a structural process, the trainers to train trainers and physical education and sports as part of the LMD reform in Tunisia.

It is through the conviction of teacher trainers of the exact design guidelines and the spirit of reform that can pass to the realization and implementation of a coherent manner, without the system project LMD.

Teacher trainers in ISSEP are called more than ever to offer students' knowledge appropriation of situations that present authentic and accessible problems. The teacher is not a mere transmitter of knowledge, but to paraphrase recognize Ph. Meirieu as a "manager of appropriation procedures".

This is a new culture that there should be at our universities. That of research and scientific production adapted and consistent with the context of the country and interdisciplinarity in a systemic approach.

#### 4. REFERENCES

1. Amade-Escot, C. (1988). La rénovation des contenus. Renouveau de la pensée didactique en EPS. Cahiers pédagogiques, n° 262, (pp. 36-38).
2. Amade-Escot, C. (1988). La rénovation des contenus. Renouveau de la pensée didactique en EPS. Cahiers pédagogiques, n° 262, (pp. 36-38).
3. Association des Universités Africaine(2008) Le guide de formation du LMD a l'usage des institutions d'enseignement supérieur d'Afrique francophone, Accra.
4. Cros, F. (1996) L'innovation en éducation et en formation. Clamecy, NIL
5. Demougeot-Lebel Joelle, Perret Cathy (2008) Une formation pédagogique peut-elle modifier les conceptions de jeunes enseignants sur l'enseignement et l'apprentissage .18ème Congrès de l'AIPU - Montpellier
6. Depelteau, F. (2000), La démarche d'une recherche en sciences humaines, de la question de départ à la communication des résultats, Bruxelles ;
7. De Boeck Donnay, J. Romainville, M. (1996) Enseigner à l'université Un métier qui s'apprend ? Bruxelles : De Boeck
8. Elaine René, Louise Guilbert. (1994) Les représentations du concept de microbe: un construit social contournable ? P 43-60 Didaskalia N° 59
9. Huberman, AM. Miles, MB. (1991), Analyse des données qualitatives, recueil de nouvelles méthodes, Bruxelles ; De Boeck
10. Meirieu, Ph. (1995) Enseigner, scénario pour UN métier nouveau, Paris: E.S.F.
11. Schubauer – Leoni M. L. (2002). Didactique comparée et représentations sociales. In AFIRE (Eds), L'année de la recherche en sciences de l'éducation. (pp.127-149).Paris: AFIRE.

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# THE EFFECT OF SPORT DIVING ON STEM CELLS CD<sup>34+</sup> AND COMPLETE BLOOD PICTURE

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## Abstract

The purpose of this study was to assess the effect of sport diving on stem cells CD<sup>34+</sup> and complete blood picture.

**Materials and Methods:** 10 male sport divers aged (23-34 yrs) with a history of diving of (5-10 years) were recruited for this study. They were instructed to dive for 45 min. Blood sample was drawn before and after diving in Hurghada Area, complete blood picture was estimated using coulter counter and CD<sup>34+</sup> was determined by flow cytometry.

**Results** showed an increased CD<sup>34+</sup> after diving compared to rest state. Also, complete blood picture increased as well.

**Conclusion:** The increased CD<sup>34+</sup> counts might indicate that diving is involved in the wellbeing and health of divers.

The elevated blood picture reported an improvement in fitness and immunity and deserve further study in diving based rehabilitation programs.

**KEYWORDS:** Diving. CD<sup>34+</sup> stem cells. Complete blood picture.

## 1. INTRODUCTION

Both commercial and sport diving expose divers to stresses that are unique to the “underwater environment”. That is, terrestrial counter parts of the stresses do not exist, or they are ordinary so minimal that they go unnoticed while a person is on land. Three main categories of stresses are encountered in the underwater environment: physical, physiological, and psychological. In almost all circumstances the diver resolves the stresses of the underwater environment through positive feedback mechanisms (Strauss and Aksenov, 2004).

The human diver’s responses to the underwater environment are of several types: physiological, automatic adjustments that the diver’s body makes these improve performance and do not harm the diver. The elevation of heart rate with exercise is an example of the physiological response to activity.

Acclimatizations, temporary changes that improve performance and occur as a result of practice or continuing exposure to the activity. Adaptations, permanent changes that improve performance. These changes are inherited Bozanic (2002). He also added that these responses are associated with positive feedback. They help the diver to better perform in the underwater environment in different perspectives: cardiovascular, respiratory, blood and muscle tissue, thermal, propulsion and orientation. Espersen et al., (2002) reported that blood is a complex mixture of cells, fluids and substances dissolved in the fluids. RbCs carry 97.5% of oxygen in the blood stream in their hemoglobin, which is an iron-containing molecule found in red blood cells that binds oxygen in the presence of high oxygen concentrations and releases it when surrounded by tissues with lower oxygen concentrations. Echenhoff and Hughes, (1984) reported an elevation of blood cells with repetitive diving.

Identification of EPCs on the cell surface expressions of various protein markers. There is no straight forward definition of an EPC marker because these cells seem to be a heterogeneous group associated with different cell surface antigen expression profiles. The most commonly described molecules that serve as biomarkers for recognition of an EPC population include CD<sup>34+</sup>, and CD<sup>133</sup>. The pioneer study of Asahara et al., (1997) recognized EPCs as CD<sup>34+</sup> mononuclear cells.

CD<sup>34+</sup> cells are multipotent progenitors that can engraft in several tissues (Krause et al., 2001), circulating CD<sup>34+</sup> cells can be used to indirectly estimate hematopoiesis based on CD<sup>38</sup>, human leukocyte antigen and CD<sup>33</sup> markers (Terstappen et al., 1997). In humans, both acute exercise (Rehman et al., 2004) and training (Laufs et al., 2004) have been shown to mobilize endothelial precursors, but the physiological response to hematopoietic cells to exercise has been systematically assessed.

The aim of this study is to reveal the effect of diving on stem cell CD<sup>34+</sup> and complete blood picture.

### The Questions to be solved:

1. What is the role played by diving on stem cell determination?
2. What is the role played by diving on complete blood picture?

## 2. MATERIAL AND METHODS

Ten healthy male divers aged (23-34 years), with a history of diving of (5-10 years) were recruited for this study. They were instructed to dive for 45 min. All participants were screened and asked to fill out healthy history, they were non diabetic, and free

of cardiovascular, lung, diver disease. Participants did not take any medications that affect EPCs number or function. These include ACE inhibitors, statins and angiotensin II receptor agonists.

All participants refrained from caffeine and any medications or vitamins 48 hours prior to the test. Blood sample was drawn before and after the diving heart rate and BMI together with stem cell CD<sup>34+</sup> and complete blood picture (Hb, Rbcs, Wbcs, MCV, MCH, MCHC, hematocrit and platelets), complete blood picture was determined by coulter counter and stem cell CD<sup>34+</sup> by flow cytometer.

In case of CD<sup>34+</sup> stem cell, the fluorochrome conjugated antibody was used to permit the identification and numeration of cell populations expressing the CD<sup>34+</sup> antigen present in human biological samples using flow cytometry.

**Table 1: Basic characteristics**

Variables	M	S.D	Ske.
Age (years)	28.1	2.6	-2.3
Height (cm)	172.75	4.30	0.52
Weight (kg)	72.30	11.68	-0.12
Pulse rate (Count/min)	64.6	8.9	0.73
BMI	23.55	5.31	0.44

Skew factor for participants were between (±3) values are means ± SD, P < 0.05.

Blood sample was drawn by a medical specialist at 19-21/12/2012 complete blood picture and CD<sup>34+</sup> stem were determined in a specialized laboratory. Diving process occurred in Hurghada area.

**Tools and devices used:**

1. Scuba apparatus.
2. Syringes, cotton, alcohol.
3. Test tubes.
4. Balance weight, Restameter.
5. Freezer and Coleman.
6. EDTA anticoagulant.
7. Coulter counter.
8. Centrifuge.
9. Flow cytometer.
10. Monoclonal antibodies against CD<sup>34+</sup>.
11. Fluorochrome.
12. Vortex.
13. Pulse meter.
14. Ice box.

The type of Scuba apparatus used in more than 99% of all sports and commercial diving is the open circuit demand system. This system consists of the following component (1) one of more tanks of compressed air or breathing mixture. (2) a first stage reducing valve for reducing the pressure. (3) a combination inhalation demand valve and exhalation valve that allows air to be pulled into the lungs with slight negative pressure of breathing and then to be exhaled into the sea at a pressure level positive to the surrounding water pressure (4) a mask and tube system with small dead space (*Graver, 1999*).

**Phase of a dive**

All diving activities can be divided into four phases:

- Surface phase.
- Descent phase.
- Bottom phase.
- Ascent and post-dive.

The surface phase of the dive includes all activities from donning gear until the diver is ready to start the descent. The descent phases commences when the diver leaves the surface. The bottom phase reflects the time from competent the descent to the time of leaving the bottom. Most sports Scuba divers make the ascent with stops at several depths as in the profile 60 FSW (18 MSW) for 30 minutes, 45 FSW (14 MSW) for 20 minutes, and 25 FSW (7.6 MSW) for 10 minutes. It is now recommended that all sport scuba divers perform a rest stop at 15 FSW (4.6 MSW) during the ascent before surfacing. Exponential efforts and energy requirements are quite different for each phase. The surface phase is usually the most challenging because of the effort of carrying



the diving gear to the diving site, donning the gear, and entering the water. The main challenge of the descent phase of the dive is the equilibration of pressure in the middle ear spaces (Berger, 2000).

**Statistical Analysis:** Student “t” tests were used to test the differences before and after diving, the difference was tested using a measure of analysis of variance (ANOVA). An  $\alpha$  level of 0.05 was used to indicate statistical significance.

### 3. RESULTS

Ten sport divers participated in the study. They were matched for age, weight, height, pulse rate and BMI non-significant changes were noticed in basic characteristics (Table 1).

Hematological values in pre and post diving was recorded for Rbcs, Wbcs, HB, MCV, MCHC, Hematocrit, MCH, and platelets (Table 2). The results revealed a significant elevation in all parameters after sport diving. Data for CD<sup>34+</sup> number and percent were recorded in Table (3), revealed a significant increase in both CD<sup>34+</sup> counts and percent for the sake of post diving compared to the rest state.

**Table 2: statistical differences of blood cells between pre and post diving (n = 10)**

Variables	Pre Diving	Post Diving	Significance
Hemoglobin (gm/dl)	13.4 ± 1.2	15.6 ± 1.5	S
Rbcs (mil/cmm)	4.6 ± 0.8	5.9 ± 0.6	S
MCH (pg)	27.9 ± 1.1	29.7 ± 1.3	S
Hematocrit %	39.7 ± 1.5	43.9 ± 1.6	S
MCV (FL)	84.1 ± 0.5	86.8 ± 0.4	S
MCHC %	42.4 ± 1.7	45.6 ± 0.9	S
Wbcs (Thou/cmm)	7.8 ± 0.7	9.2 ± 0.6	S
Platelets (Thou/cmm)	230.6 ± 3.5	264.7 ± 4.1	S

Table (2) indicated a significant difference between pre and post diving  $P < 0.05$  Mean ± SD

**Table 3: statistical differences of CD34<sup>+</sup> counts and CD34<sup>+</sup>% between pre and post diving (n = 10)**

Variables	Pre Diving	Post Diving	Significance
CD <sup>34+</sup> (counts)	56.4 ± 3.4	132.2 ± 5.2	S
CD <sup>34+</sup> (%)	0.93 ± 0.1	3.4 ± 0.6	S

Table (3) indicated a significant difference between pre and post diving in CD<sup>34+</sup> counts and %  $P < 0.05$

### 4. DISCUSSION

Physiological stresses are associated with the normal functions of the body. Physiological stresses associated with diving relate primarily to ventilation, that is, the breathing in the oxygen and the exhalation of carbon dioxide. In addition, nitrogen, the inert gas that comprises approximately 79% of the air we breathe, equilibrates with the nitrogen in our body tissues. Two methods mediate the ventilation stresses on a diver while underwater: breath holding and the supply of an air source to the diver (Bachrach and Egstrom, 1999).

The data presented in Table (2) revealed a significant increase in (Hb, Rbcs, Hematocrit, MCV, MCH, MCHC) after diving compared to the resting state.

Barrett et al., (2010) in Ganong review of medical physiology stated that blood consists of a protein rich fluid known as plasma, in which are suspended cellular elements: Rbcs, Wbcs and platelets, which are formed in the bone marrow which is actually one of the largest organ in the body. Hematopoietic stem cells are bone marrow cells that are capable of producing all types of blood cells.

Burge et al., (1993) and Gillen et al., (1991) reported that acute effect of exercise on blood is to cause release of fluid from the vascular component, which decreases the volume of plasma and blood. This decreases volume cause hematocrit and cellular element to increase, which is termed hemoconcentration. The hemoconcentration may be the main cause of the increased blood cells.

Robergs and Roberts (1997) stated that the main functions of the cellular components of blood are the transport of oxygen and carbon dioxide, blood clotting, acid base buffering, immune functions and tissue repair and destruction, heat transfer and thermoregulation, and plasma help water exchange and transport, circulation of hormones, circulation of metabolites, and waste products.

Hemoglobin bind oxygen in the lungs, then the oxygen laden red blood cells are carried by the blood stream throughout the body to the tissues. The tissues then utilize the oxygen for metabolic purposes. All cells of the body require oxygen such as the brain, the muscles and the heart and it is not by coincidence that the diving reflex ensures adequate provision of oxygen to the most critical tissues of the body during the breath hold dive (Marabotti et al., 1999 and Castellini et al., 2001).

Guyton and Hall (2006) reported that white blood cells are the mobile units of the body's protective system. They are formed partially in the bone marrow (granulocytes, monocytes and a few lymphocytes) and partially in the lymph tissue (lymphocytes and plasma cells). They provide a rapid and potent defense against infectious agents. They also added that the adult human being has about 7000 white blood cells per microliter of blood and that the number of platelets, which are only cell fragments in each microliter of blood is normally about 300000.

The increased Wbcs and platelets in Table (2) revealed that these cells work together to prevent disease by destroyed invading bacteria and forming antibodies and that platelets is an active structure that help in the blood-clotting process.

The data presented in Table (3) revealed a significant increased  $CD^{34+}$  stem cells count and percent after diving. Many authors reported an increased stem cells concentration after exercise Zaldivar et al., (2007), Jung et al., (2008), Hoellriegel et al., (2007), Hoellriegel et al., (2008) and Laura Bilek (2008), Wall et al., (2008).

The number of circulating stem cells represents the balance between liberation of stem cells from the bone marrow and incorporation at the level of the vessel. Laufs et al., (2005) demonstrated that  $CD^{34+}$  increased after 30 minutes of high intensity running in healthy participants.

Ewa and Parvet (2007) reported that a decrease in the blood supply to a bodily organ or tissue, caused by constrictor or obstruction of the blood vessels is a common cause of ischemia.

Adams et al., (2004) found that peripheral blood stem cells counts were increased significantly in ischemic patients within 24-48 hours after exercise, this was accompanied with elevation of VEGF concentration in plasma. These results confirmed that VEGF is a significant factor responsible for stem cells stimulation from bone marrow to peripheral blood.

Sarah Witkowski, (2010) reported that exercise may improve the number and function of stem cells while improving oxidative stress status.

The researchers' opinion is that stress and ischemia might be the main factors in stimulating stem cells and blood cells egress.

The discussion answer the questions to be solved, about the role played by diving on stem cells determination and about the role played by diving on complete blood picture. Diving play a positive role in increasing both stem cells and cellular blood components.

## 5. CONCLUSION

- $CD^{34+}$  counts increased after diving due to stress, indicating a positive effect in well being and health of participants.
- The increased blood cells counts indicated an improvement in fitness and immunity, and deserve further study in diving based rehabilitation programs.

## 6. REFERENCES

1. Adams, V; Lenk, K; Linke, A. (2004): Increase in circulating endothelial progenitor cells in patients with CAD after exercise induced ischemia. *Arterioscl. Thromb. Vas.* 24: 684-690.
2. Asahara, T; Takahashi, T; Masuda, H. (1997): VEGF contributes to vasculization by mobilizing bone marrow progenitor cells *EMBO J* 18: 3964-3972.
3. Bachrach, A. and Egstrom, G. (1999): *Stress and performance in diving* flagstaff, Publ. Co. USA.
4. Barrett, K; Barman, S; Boitan, S, (2010): *Ganong's review of medical physiology*, 23ed McGraw Hill, Lange, USA.
5. Berger, K; Hildebrand, M; Hildebrand, F. (2000): *Scuba diving*, New York: Norton.
6. Bozanic, J. (2002): *Mastering rebreather* flagstaff, Publ. Co, USA.
7. Burge, C; Carey, M; Payne, W. (1993): Rowing performance fluid balance and metabolic function following dehydration and rehydration. *Med. Sci. Sport Exer.* 25: 1358-1364.
8. Castellini, M; Castellini, J; Rivera, P (2001): Adaptation to pressure in the RBC metabolism of diving mammals. *Comp. Biochem. Physiol.* 129: 751-757.
9. Echenhoff, R and Hughes, J (1984): Hematologic and hemostatic changes with repetitive air diving. *Avial Space Environ Med.* 55: 592-597.
10. Espersen, K; Frandsen, T; Lorentzen, I (2002): The human spleen as an erythrocyte reservoir in diving-related interventions. *J Appl Physiol.* 92: 2071-2079.

11. Ewa, M and Pawet, J (2007): Endothelial progenitor cells as a new agent contributing to vascular repair. Arch Immunol. Ther Experim. 55: 247-259.
12. Gillen, C; Lee, R; Mack, G (1991): Plasma volume expansion in human after a single intense exercise protocol. J Appl. Physiol. 71: 1914-1920.
13. Graver, D (1999): Scuba Diving Champain, Human Kinetics, USA.
14. Guyton, A and Hall, J (2006): Medical Physiology Elsevier, Saunders, USA.
15. Hoetzer, G; Mac Eneemey, O; Irmiger, H (2007): Gender differencies in progenitor cell colony capacity and migratory activity in middle aged adults. Am. J. Cardiol. 99: 46-48.
16. Hoellriegel, R; Erbs, A; Schuler, S (2008): Regular physical exercise training promotes neovascularization in the skeletal muscle. Univ. Leipzig, Heart Center, Germany.
17. Jung, L; Tswee, L; Kollet, O (2008): Effect of endurance exercise on stem cells. J Appl. Physiol. 105: 212-222.
18. Krause, D; Theise, N; Collector, M. (2001): Multiorgan multi-Lineage engraftment by a single bone marrow derived stem cell. 105: 369-377.
19. Laufs, U; Ur Hausen, A; Werner, N (2005): Running exercise of different duration and intensity. Eur J Cardiovasc. Prev Reh. 12: 404-417.
20. Laufs, U; Werner, N; Nichenig, G (2004): Physical training increase progenitor cells, inhibits neointima formation and enhances angiogenesis. Circulation 109: 220-226.
21. Laura Bilek (2008): Relationship between physical activity and stem cell in older adults Univ. of Nebraska, Med. Center Clinical Trials NCT 00690183.
22. Marabotti, C; Chiesa, A; Lari, R (1999): Cardiac and humoral changes induced by recreational scuba diving under sea Hyperb. Med. 26: 151-158.
23. Rehman, J; Parvathanenin, L; Karlsson, G (2004): Exercise acutely increases circulating progenitor cells, monocyte, macrophage derived angiogenic cells. J Am Coll Cardiol 43: 2314-2318.
24. Robergs, R and Roberts, S (1997): Exercise physiology Mosby, Yearbook inc. USA.
25. Sarah Witkowski (2010): Effect of long term exercise on progenitor cells in human Dissertation Fac. of Graduate School Univ. Maryland, USA.
26. Strauss, M and Aksenov, I (2004): Diving Science, Human Kinetics, U.S.A.
27. Terstappen, P; Robert, K; William, P. (1997): Circulating CD34+ to estimate Hematopoiesis Cell 89: 230-239.
28. Wall, P; Klara, B; Eilhelm, B. (2008): Exercise induced stem cell activation and muscle regeneration. Invasive Therapy, 17: 91-99.
29. . Zaldivar, F; Eliakim, A; Leu, S (2007): The effect of brief exercise on circulating CD34+ stem cells in early and late pubertal boys. Pediat. Res. 61:491-495.

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# THE EFFECT OF THE BIOMECHANICAL ANALYSIS TO INCREASE SPEED ACCORDANCE WITH THE CENTRIFUGAL FORCE OF THE DIFFERENT AREAS OF THE COMPLETION OF THE ENEMY OF THE 200M CURVE

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## Abstract

Researcher noted that most of the players are ignoring the increasing speed according to the centrifugal force of the different areas of the curve because of the lack of values that are available are abridged in one area knowing that the radii vary depending on the areas resulting in the intensity of inclination of the curve, which vary from area to another, which is affected by the value of the centrifugal force which obliges the player to change body position mechanically (Milan) to remove the effect of centrifugal force, so sought researcher to provide information about those values and thus contribute even a little to improve the level of achievement for any field of study aimed to identify the biomechanical of the increasing speed values of the variables according to centrifugal force at the different areas curve 200 meters as well as the effect of biomechanical variables to the increasing speed and power repellant when the different areas 200 curve Mitrokd values researcher used descriptive manner relational relations and comparison to solve the problem purely as researcher identified the research community who are the players in the team Qadisiyah University of the effectiveness of 200 m for the academic year 2014 who got the best achievements totaling (4) players, has been trying to give each player on each field (8,6,4,2) according to different areas ran 200 m curve for all members of the sample so that the total number of attempts (16) attempt, was to identify some of the variables that represent the sample and the sample specifications normally distributed the study found there is a direct effect of the increasing speed of the variables in the maximum impact of the centrifugal force in the stage ran the effectiveness of the 200-meter curve.

There fluctuation in speed between increases and decreases in the areas identified by the researcher for each stage of the maximum effect of centrifugal force that ran the curve for all runners.

**KEYWORDS:** Biomechanical analysis. Increasing speed. Centrifugal force. The enemy of 200 m.

## 1. INTRODUCTION

The science of biomechanics of modern science that influenced the scientific progress of the human motor performance, which specialized sports movement and motor performance, which has had a significant impact on the progress of modern indices.

The Games track and field of the most important sports which translates reflect an objective manner the progress of nations as characterized by objectively evaluating human achievement as achievements translate into digital levels represented Bozmna and distances through the mechanical properties, and to achieve it is not only through physical and skill training, but the development of motor abilities and developed for Using biomechanical analysis of these events effectiveness ran the (200 m) that have privacy because the sports in which the first section runs in the form of a curve and the other half on a straight shape and the variables that occur during the running of the curve on the body of hostility play a major role in the achievement through the mechanical status of the body hostility during ran the curve where the areas of sprinting vary as a result of differing radii areas which result in mechanical effects affect the hostility different areas.

The importance of research to identify the biomechanical effect of the increasing speed values of the variables according to the centrifugal force affected in different areas ran arch enemy of the effectiveness of the curve of 200 m.

### Research problem:

The goal of the basic hostility to obtain transition speed better while this speed is affected curvature curve and this curvature varies from area to another depending on the radii areas, the researcher after studying the previous literature sources and references (letters and theses) as well as conducting personal interviews to specialists noted researcher that most of the players are ignoring the increasing speed according to the centrifugal force of the different areas of the curve because of the lack of values that are available are abridged in one area knowing that the radii vary depending on the areas resulting in the intensity of inclination of the curve, which vary from area to another, which is affected by the value of the centrifugal force, which obliges the player to change body position mechanically (Milan) to remove the effect of centrifugal force, so the researcher sought to provide information about those values and thus to contribute even a little to improve the level of achievement in any field.

### Research Aim:

1. Biomechanical of the increasing speed values of the variables according to the centrifugal force at the different areas of 200 meters curve.
2. Following biomechanical variables to the increasing speed and centrifugal force at the different areas of 200 meters curve values.

## 2. MATERIAL AND METHODS

The researcher used descriptive manner relational relations and comparison to solve the problem purely.

**Society and the research sample**

Researcher select community purely illusion players elected Qadisiyah University of the effectiveness of 200 m for the academic year 2014 who got the best achievements totaling (4) players, was given a bid for each player on each field (8,6,4,2) according to different areas ran curve of 200 m for all members of the sample so that the total number of attempts (16) attempt, was to identify some of the variables that represent the sample specifications and the sample is normally distributed.

**Table 1: represents specifications research sample**

Variables	unit of measurement	Average	S.D	Mediator	Torsion modulus
The length of the trunk	Cm	63.03	4.312	62	-0.27
The length of a man	Cm	105.32	7.53	103	-0.53
Bloc	K gm	73.28	3.52	71	0.42
Overall length	Cm	186.75	11.47	184	-0.31
Age training	Year	4.5	0.96	4	0.43
Chronological age	Year	22.64	2.71	21	0.68
XD	seonde	23.53	3.42	22.25	0.72

The run test (200m) completion (Baydaa Razak Jawad,2007)

**Main experience:**

The researcher conducting the experiment on the main (10/04/2014), by installing cameras where each player was given one attempt at each of the four areas of sites, namely, (2,4,6,8), was calculated completion of 200 full time and ran a time curve.

**3. RESULTS AND DISCUSSION**

Showing results bio mechanical variables affecting the increasing speed values by area ran curve of 200 m and achievement and analysis and discussion

**Table 2: shows the computational community values and standard deviations for the variables biomechanical for increasing speed according to the centrifugal force.**

Areas ran effectiveness of 200 m								Biomech anical variables	t	Perform ance stages
Field (2)		Field (4)		Field (6)		Field (8)				
average	S.D	Average	S.D	average	S.D	average	S.D			
187.43	0.290	2.08	<b>2.539</b>	203.09	0.147	200.75	<b>0.0722</b>	Average stride length (m / number(	1	Increasing speed
4.314	0.3556	4.32	<b>0.411</b>	4.523	0.325	4.414	<b>0.3380</b>	Step frequency rate (number / s(	2	
135.28	8.887	128.75	<b>9.781</b>	129.18	5.626	131.2	<b>13.186</b>	Detailed hip angle for maximum impact moment (degrees(	3	
48.74	8.866	47.9375	<b>7.701</b>	50.187	9.022	47.5	<b>10.080</b>	The maximum extension of the shoulder joint right moment maximum impact (degrees(	4	
0.27	0.0144	0.18	<b>0.0111</b>	0.165	0.006	0.146	<b>0.0078</b>	Under the angle of inclination (degrees) for maximum impact moment	5	
122.34	10.627	116.95	<b>8.239</b>	113.46	12.39	105.36	<b>16.135</b>	Centrifugal force (Net) the moment of maximum impact	6	
14.47	3.112	11.625	<b>5.492</b>	10.04	2.031	7.25	<b>1.25</b>	Milan player angle (degrees) for maximum impact moment	7	
0.28	0.337	0.122	<b>0.0107</b>	0.131	0.014	0.1658	<b>0.0083</b>	Flight time for the moment of maximum impact (s(	8	
12.54	0.398	12.395	<b>0.804</b>	12.088	0.324	12.182	<b>0.7019</b>	Curve distance time (seconds(	9	Ran the curve
8.27	0.273	8.053	<b>0.227</b>	8.0127	0.247	7.940	<b>0.228</b>	Sinusoidal speed (m / s(	10	
23.47	0.7095	24.27	<b>0.681</b>	23.25	0.798	23.21	<b>0.7377</b>	Achievement (Tha(	11	

The player take mechanic put different to reduce the effect of centrifugal force and noted that the kinetic term point of hip larger than the kinetic term point of the shoulder or drafted again that the point is driven hip point is greater than the distance driven by the shoulder point and be appropriate to achieve the required speed and hip represents a center of a circle going around joints of the body, which makes us expect that the path to the circumference of the circle will be small and coincides with the event had a significant transition in the shoulder path, and ranged values under the angle of inclination due to increased player of the amounts of speed because the speed is proportional to the light angle of inclination and inversely proportional to the radius of the sphere and to accelerate the player played down from the corner to maintain the speed, the centrifugal force different values between the field



and the last was the biggest force the expulsion of sustained hostility in the second field, followed by other areas and then took a centrifugal force to rise to up to a maximum in the second domain, and then gradually decreased in other areas, which confirms that the runner has the ability the synergy because (because whenever the radius of the Palace area leads to an increase in the attractive force or centrifugal) (Hussein Mardan Omar 0.100: 2011), and the highest value for the angle Milan player in the second field and why the smaller radius increased the influence of the force repellents on the player who shall player to take a mechanic put appropriate, a tilt of the inside to maintain the speed and achieve the feat, we find that the forces acting on the body movement during a straight movement are almost parallel to compare the influence of external forces continually on track ring he must strike a balance between action strength (of centrifugal force) reaction (of degree inclination), and the best speed of a runner on the curve and different reason that these areas is under the influence of centrifugal force and thus the player resist this force rods inside are considerably less so the amounts of distance and time that are necessary to maintain the speed as the speed is an important factor of trying to factors limiting the hands of the main level in racing various athletics, especially the effectiveness of 200 m, which have significant relationship with the power that be at the first two forms issued by the body and the second external force (centrifugal force) in running the curve depends produce the first force that depends on the speed and strength of contraction and is characterized by the rapid run two special characteristics Mechanicals main stride length and frequency and is associated with many of the mechanical conditions to perform a step flight time and frequency steps.

**Table 3: present the results of the differences in the biomechanical variables to the areas of effectiveness ran the 200-meter curve values**

t	Variables	Source of variation	Sum of squares	Degree of freedom	Average squares	f	Sig
1	Average length of step	Among the areas	141.02	3	47.008	7.079	.000
		Within areas	398.423	60	6.640		
		Total	539.447	63			
2	Step frequency rate	Among the areas	0.448	3	0.149	1.175	0.334
		Within areas	7.747	60	0.129		
		Total	8.196	63			
3	Detailed angle hip moment maximum impact	Among the areas	517.422	3	172.474	1.701	0.176
		Within areas	6083.188	60	101.386		
		Total	6600.609	63			
4	The maximum extension of the shoulder joint right moment maximum impact	Among the areas	113.547	3	37.849	.442	0.724
		Within areas	5135.313	60	85.589		
		Total	5248.859	63			
5	Under the angle of inclination of the moment the maximum impact	Among the areas	.011	3	.004	29.767	.000
		Within areas	.008	60	.000		
		Total	.019	63			
6	Orbital inclination player the moment the maximum impact	Among the areas	730.400	3	243.467	20.045	.000
		Within areas	728.763	60	12.146		
		Total	1459.164	63			
7	Step away for a moment the maximum impact	Among the areas	4326.925	3	1442.30	.606	.614
		Within areas	142769.9	60	2379.49		
		Total	147096.8	63			
8	Centrifugal force moment maximum impact	Among the areas	1661.851	3	553.950	3.494	.021
		Within areas	9511.237	60	158.521		
		Total	11173.08	63			
9	Curve distance time	Among the areas	3.220	3	1.073	2.867	.044
		Within areas	22.463	60	.374		
		Total	25.684	63			
10	Flight time for the moment of maximum impact	Among the areas	.326	3	.109	3.553	.020
		Within areas	1.834	60	.031		
		Total	2.160	63			
11	Speed sinusoidal	Among the areas	.114	3	.038	.595	.621
		Within areas	3.846	60	.064		
		Total	3.960	63			
12		Among the areas	8.374	3	2.791	5.813	.001
		Within areas	28.813	60	.480		
		Total	37.187	63			

Notes that the frequency steps rate in those areas was a random value attributable researcher so that the technique of performance of a runner in the first three fields begin the gradual increase in stride length and frequency to reach the regular maximum speed in which the length and frequency step almost invariably either increase the step frequency in the area rate the

second because of the effect of centrifugal force which leads to decision-player mode mechanic has led to increased step frequency rate and thus reduce the speed, either hip angle in the fields is random and researcher attributes this to the approximate symmetry in aviation, building and the gradual increase in the length and frequency step time either lack of detailed angle hip in the first field, because the angle made by a man hostility were not optimal because of the mechanical status of the player who influenced him centrifugal force and continuous training on this area and confirms (Qassim Hassan and faith Shaker) that (the movement of the two men spoke in front level, as well as the arms that prevent hip and rotation next leg movement must be accompanied bend the knee, (to shorten the length of the resistance arm, which means the economy in voltage) (Qassim Hassan Hussein Wyman Shaker 2000 (100-96, hostility kept symmetric at a rate of speed in all areas either collecting speed in the fourth area was due to the mechanical status of the player, which led to a lack of length and step frequency, one of the main factors affecting the speed.

**LSD moral differences in the variables bio mechanical fields ran the effectiveness of the 200-meter and analyzed and discussed the curve values:**

**Table 4: differences in moral LSD biomechanical variables to the areas of effectiveness ran the 200-meter curve values**

t	Variables	fields		Averages	Averages teams	The standard error	Significance
1	Average length of step	1	3	1.7925-2.71464	-.92215-	.91107	<b>.000</b>
		1	5	1.7925 -2.03096	-.23846-	.91107	<b>.794</b>
		1	7	1.7925 -2.00753	-.21504-	.91107	<b>.814</b>
		3	5	2.71464 -2.0309	.68368	.91107	<b>.001</b>
		3	7	2.71464 -2.0075	.70711	.91107	<b>.000</b>
		5	7	2.0309 -2.00753	.02343	.91107	<b>.980</b>
2	Under the angle of inclination of the moment the maximum impact	1	3	0.176875 -0.18	-.00313-	.00396	<b>.433</b>
		1	5	0.17687 -0.1656	.01125*	.00396	<b>.006</b>
		1	7	0.1768 -0.14625	.03062*	.00396	<b>.000</b>
		3	5	0.18 -0.16562	.01438*	.00396	<b>.001</b>
		3	7	0.18 -0.14625	.03375*	.00396	<b>.000</b>
		5	7	0.1656 -0.14625	-.01938-	.00396	<b>.000</b>
3	Orbital inclination 4player the moment the maximum impact	1	7	15.75 -7.99375	7.75625*	.77962	<b>.000</b>
		1	3	15.75 -9	6.75000*	.77962	<b>.000</b>
		1	7	15.75 -7.25	8.50000*	.77962	<b>.000</b>
		3	5	7.99375 -9	-1.00625-	.77962	<b>.001</b>
		3	7	7.99375 -7.25	0.74375	.77962	<b>.000</b>
		5	7	9 -7.25	1.75000	.77962	<b>.028</b>
4	Centrifugal force moment maximum impact	1	3	116.95 -118.579	1.62122	4.45141	<b>.717</b>
		1	5	116.95 -113.465	5.11356	4.45141	<b>.255</b>
		1	7	116.95 -105.367	13.21203*	4.45141	<b>.004</b>
		3	5	118.57 -113.465	-3.49233-	4.45141	<b>.436</b>
		3	7	118.57 -105.367	11.59080	4.45141	<b>.012</b>
		5	7	113.465 -105.36	-8.09847-	4.45141	<b>.074</b>
5	Curve distance time	1	3	12.6721 -12.395	.27699	.21633	<b>.205</b>
		1	5	12.088 -2.67217	.58348*	.21633	<b>.009</b>
		1	7	-12.6721 12.182	.48976*	.21633	<b>.027</b>
		3	5	12.395 -12.0886	.30649	.21633	<b>.162</b>
		3	7	12.395 -12.1824	.21278	.21633	<b>.329</b>
		5	7	12.088 -12.1824	-.09372-	.21633	<b>.666</b>
6	Flight time for the moment of maximum impact	1	3	0.3004 -0.12243	.17800*	.06182	<b>.006</b>
		1	5	0.3004 -0.13156	.16888*	.06182	<b>.008</b>
		1	7	0.3004 -0.16581	.13463*	.06182	<b>.033</b>
		3	5	0.12243 -0.1315	-.00912-	.06182	<b>.883</b>
		3	7	0.12243 -0.1658	-.04337-	.06182	<b>.486</b>
		5	7	0.1315 -0.16581	-.03425-	.06182	<b>.582</b>

Differences between light inclination angle in the fields is a moral attribute researcher these differences to the effect of centrifugal force and the different radii areas and if we know that the inverse relationship between centrifugal and radius of force where the greater half of the diameter of the area say the effect of centrifugal force on the player so you must know the inclination angle must be athletic body lay in order to avoid the effect of centrifugal force, either the highest moral value of the difference between the angle Milan player in the fields attribute the researcher this difference that the centrifugal force affected areas at different rates Animosity is heading with the centrifugal force, which calls for the body's need to modes first take put biomechanical suitable for angle Milan to the inside to overcome the effect of centrifugal force and the second to reduce speed who shall player to take the

first situation is the inclination of the inside and firmly bloc able to maintain the speed, either differences in the areas of strength repellents are moral attributes researcher that the different stages of the enemy of the curve as the runner moves the speed of incremental to top speed and because the speed of basic terms in the equation of power repellent, so the reason for the change centrifugal force values be due to a change in the radius of the curve speed meaning that centrifugal force values differed differences calculation between distance and other researcher believes that the weak capacity of hostility in the gradient in speed due to poor ability to issue appropriate force and distribution amounts (distribution of intensity) at various distances of the curve, and through the width of the table data (4) and analysis show that the differences in the time values reached by the hostility is a moral reason for this surge in speed rate hostility that reached out to the maximum impact of the stronger centrifugal stage, in which times are equally cut distances, which could be up to accelerate them to zero and depends on the ability of hostility and its ability to carry speed and said the effect of centrifugal force him and after the radius of the sphere in the curve so the hostility time remains identical, the differences between the flight step time is a moral reason for this is that the flight time step is influenced by the speed and distance of the curve as well as after the radius of these areas led to you said the impact of expelling them power and thus Say airline step time and attribute the researcher the reason for this change to the near radius area in the curve leading to be the effect of centrifugal force on the big player because the relationship reverse them, which led to an increase in the flight step time, either the differences between achievement is moral and came as best achievement and this shows that the achievement of value is the one type of change because after half Qatar field on the curve leading to the lack of effect of centrifugal force and the length and frequency step and speed either achievement was a different value and the reason for this is that the achievement is affected by forcibly expelling situation mechanical player as well as speed, distance and angle of inclination and the rate of length and frequency step.

#### 4. CONCLUSION

1. There is a direct effect of the increasing speed of the variables in the maximum impact of the centrifugal force in the stage ran the effectiveness of the 200-meter curve.
2. There is a fluctuation in speed between increases and decreases in the areas identified by the researcher for each stage of the maximum effect of centrifugal force that ran the curve for all runners.
3. The fundamental difference in biomechanical variables between the areas of maximum phase effect of centrifugal force at the stage ran the curve variables.
4. any biomechanical change in any stage of the effectiveness of the 200-meter clearly affects the subsequent phase due to the stability of the determinants of performance, whether it is linked to the rules of the game on the one hand, or in terms of the exploitation of biomechanical laws, on the other hand.

#### 5. REFERENCES

1. Baydaa Razak Jawad: the impact of the use of Phosphodiesterase creatine compound within the proposal for the development of some of the physical and functional capabilities of hostile training program (200 m), juniors (16-17 years), Master Thesis Unpublished, Baghdad University, 2007.
2. Mardan Omar Hussein, Iyad Abdel-Rahman: Albayumikanek in the field of sports, i 1, Najaf 0.2011.
3. Fouad Tawfiq al-Samarrai: biomechanical, Mosul, National Library for printing and publishing 0.1982, p. 23.
4. Qassim Hassan Hussein Wyman Shaker Mahmoud: mechanical, analytical and technical foundations of events in track and field, Baghdad 0.2000.
5. Wajih Mahjoub: Research Methods and methods, 2nd Floor, House of Wisdom for printing and publishing, Baghdad, 1988
6. Wadih al-Tikriti, and Muhammad Yasin Hassan al-Obeidi: statistical applications and uses of computer in Physical Education, Mosul, Baghdad University, 1999.
7. Yousef Al Anzi: educational research between theory and application platforms, i 1, Kuwait, Publishing and Distribution farmer library 0.1999.

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# THE IMPACT OF A PROPOSED REHABILITATION APPROACH USING SOME OF THE TOOLS AND THERAPEUTIC EXERCISES TO REHABILITATE THE MUSCLES OF THE LOWER LIMB INJURIES BASKETBALL PLAYERS (YOUTH)

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## Abstract

The study included four sections, the researcher in the first section introduce to the idea of research, in view of the development of physical and sports activities and increase the burden on athletes and the requirements of this increases the probability of the occurrence of sports injuries and this may adversely affect the athlete's physical condition and therefore tender in addition to the possibility of aggravation of the injury and the subsequent consequences and effects on solid athlete.

And summarized the goals Search by:

1. Therapeutic approach using specific therapeutic means for basketball players put (youth).
2. Identify the effect of therapeutic and rehabilitative approach to the research sample members in the tribal tests reported in a posteriori.

Kdastkhaddm researchers and experimental approach Kmaachtert sample-style intentional The most important bricks adopted by researchers to reach the search results that he used a variety of means for the purpose of determining the severity of the infection and measured in addition to verification of the level of success of the proposed approach after its implementation and this means is:

And summarized the goals Search by:

1. Therapeutic approach using specific therapeutic means for basketball players put (youth).
2. Identify the effect of therapeutic and rehabilitative approach to the research sample members in the tribal tests reported in a posteriori.

The researchers used the experimental method was selected as the sample-style intentional The most important bricks adopted by researchers to reach the search results that he used a variety of means for the purpose of determining the severity of the infection and measured in addition to verification of the level of success of the proposed approach and after the implementation of these methods are:

1. Measuring thigh circumference infected man
- 2- Measure the degree of pain
3. Measuring degree of strength in legs
4. Measure the strength of the muscles of the thighs front
- 5- Measure the strength of the muscles of the back thighs

Then introduced the research sample of the proposed approach qualifying for this researchers used a number of therapeutic means and identified according to the opinion of doctors and the type and severity of injury where identified casualties bruise muscle and tear muscular simple, medium, and the means as a blogger in below where experts identified four of the means used researchers begin treating hour injury and even start rehabilitative approach, namely:

Infrared (I.R).

- Cooling.
- Massage device (electric massage).
- Manual massage.

After processing the results statistically they found a set of conclusions are: And no statistically significant differences between tribal and dimensional tests for the research sample of indicators for reducing the degree of pain

- 1- And no statistically significant differences between tribal and dimensional tests for the research sample of indicators for the development of strength degree in legs.
- 2- No statistically significant differences between tribal and dimensional tests for the research sample of indicators for the development of muscle strength femoral front.

**KEYWORDS: Rehabilitate. Muscles. Injuries**

## 1. INTRODUCTION

The sports medicine and physiology of sports training of the most important areas in which there are a lot of developments in recent years because of scientific experiments and research that was and is still the only concern is to raise the technical level of the sport in general and the access level athletes to the highest possible where there are no more limit to reach him and stop him but everything has become possible to take advantage of it for the development of the sports level.

The progress and great development in the field of sports led to higher progress in other sciences related to the sport of all, because of this science from a great relationship in sports activity, which affects directly on the development of systems and vital organs of the athlete according to the effectiveness of the practice, especially in the field of sports medicine and rehabilitation, which saw a major development for the re-injured players to practice sporting events and avoid a repeat of the injury again.

This science has contributed to the development of methods of training and legalization of training loads to be more suitable for the body's ability to endure and benefit from the positive effects of the state of the functional body, however, the training curriculum vocabulary with all its components receive the various organs of the body and joints and Erbth and tissues and muscles and a large button, whether at sports training or competition, or when sports injuries that injuries may be the result of stress athlete or as a result of friction instrument or discount, as well as, the injury rate increases if the athletic training in a non-scientific, using mathematical tools inappropriate for the age or fitness of the individual.

Statistics have shown that basketball effectiveness of events included a lot of injuries related to motor device ears occupies second place after the ice hockey, which came first place Larry, F, Ellison, 1995: 3)), and from here, but in order to contribute to the rehabilitation and the return of injured players and their return to stadiums came the importance of research, which lies in avoiding the arrival of the player to cases of muscle injuries and chronic or so-called deficit muscular chronic resulting from the return of injured player to stadiums without undergoing a qualifying program leading to a doubling of the injury and then not feel the player pain in spite of the injury, because the that the injury took a new shape structurally, which led to chronic infection as well as the enrichment of our library sports such Thus Research.

Research problem:

The privacy and the nature of the requirements contained in the game of basketball from a complex physical movements and friction direct between the players, and what difficult and complex and the large and small joints and ligaments where the bones of the combination, and through experience and observation researcher for being one of the basketball players previously coached currently. Found that there are a lot of injuries occur to the player, leading to obtain distortions result in a lot of players excluded and the loss of this event for them, because of the lack of presence exercises a private rehabilitation aims to return them to the stadiums to practice their sport again and the lack of incidence again and the lack of methods for the preparation of physical proper chronological age at the beginning of the training.

Increasing the proportion of injuries among athletes greater the unit sports competitions and spread, especially muscular nervous system injuries, as it constitutes sports practice pressure on joints and ligaments and purses Synovial and tendons, muscles and bony vertebrae of the spine, which may cause chronic injury, as well as the injuries resulting from friction with discount and falls suffered by the player that form are other broader level of these sports injuries, and a review of the technical types to those injuries, according to informed researcher, the majority of injuries and a large proportion were the bruises muscle and dislocations hinge and tears the muscle and tendons that these injuries due to the lack of commitment to the application of training assets modern scientific as well as the lack of proper diagnosis of the injury to the lack of a specialist doctor, as well as the lack of scientific methods and technical treatment, and the effect of the male and for the return of injured players to the stadiums were therapeutic means diagnosed and exercise rehabilitation, one of the most central means impact in the treatment of injured athletes and rehabilitation as well as accelerate the restore muscles and joints functional potential.

So he saw the researcher to use a training curriculum therapeutic rehabilitative some means of various therapeutic modalities aimed involved with training qualification upon completion of the treatment of basketball players after infection attempt by the researcher to complete ready player to achieve sporting achievement required based on the basis of the relationship between the physiology of sports training and requirements of physical therapy that relationship that from which to address the lower limb muscle injuries that may lead to the disruption of the balance of forces inflicted in the case left, leading to acute and chronic injury and then move away from the stadiums.

The research aims to:

1. Therapeutic approach using specific therapeutic means for basketball players put (youth).
2. Identify the effect of therapeutic and rehabilitative approach to the research sample members in the tribal tests reported in a posteriori.

## 2. MATERIAL AND METHODS

The researchers used experimental method for the suitability of the research problem.

**The research community and appointed:**

Chose researchers appointed by the basketball players youth neo-induced and that the nature of the study, which requires the identification of injuries, players and treatment for this the researchers choose (8) players of all young players in Suleikh Sports Club and Club Baghdad Municipality sports at a rate (4) players from the Municipality of Baghdad Club and (4) players from the players Selakh Sports Club chosen way intentional who have an injury to the lower sides and the fact that research depends on the injury and diagnosis which in turn is dependent on the lengths or weights or even old training.

**Tests and measurements used to search:**



I've been testing and measurements on a group of experts before starting the exploratory experiment and after the application of this experience all the tests and measurements is ready for application, as follows.

Measuring thigh circumference infected man:

- The purpose of the measure:

Measuring thigh circumference of the infected man.

- Tools used:

Terrace suitable height standing by the player.

- Description of performance:

Stands injured player upright and then are measured thigh length "of the greater trochanter of the head Supreme femur and even brutal edge detailed mid-knee" (1-63) then is multiplied by the value of  $(\text{length} \times 1/3)$  is obtained by one-third the length of the groin area. "after determining the lower section area is measured by total hip circumference measuring tape.

Measure the degree of pain:

That measure the degree of pain diagnosis and Rated and treatment is subject to the doctor's opinion was the consultant physician, another of the support staff in the diagnosis and treatment of sports injuries diagnosis of injury and determine the degree of pain and then determine the means by which that can cut off the pain was then a post-test to determine the degree of pain.

measure the strength degree of the muscles of the two men:

- The purpose of the measure:

- measuring muscle strength of the quadriceps front and rear test bend legs fully extended.

Tools used:

The use of body weight only.

Performance description:

Laboratory and his hand behind his head tangled with giving the signal to start the laboratory fully bend his legs and Mayorma with erection put the trunk, and counted the number of times the crease and the tide with exhausting effort.

Measure the strength of the muscles of the thighs front:

- The purpose of the measure:

- Measure the strength of the muscles of the thighs front.

- The tools used to implement the test:

- multi gym device.

- Description of the test:

Laboratory sits on the bench dedicated to measuring the multi gym device (front part) to sit down and put the two men bent puts feet on lifting levers and then lift the legs from the knee joint where the weight is placed on the lever according to the method of the test subject.

Measure the strength of the muscles of the back thighs:

- The purpose of the measure:

(Measure the strength of the muscles of the back thighs).

- The tools used to implement the test of multi gym device.

Description test:

Lie face down on a bench dedicated to measuring the multi gym drag back on the device multi gym lift lever mounted gravity from the rear of the top several times in accordance with the theme of the test method (Mohamed Hassanein, 1995: 46).

Therapeutic curriculum:

After the interview, which was conducted by researchers with the selection of specialists sports medicine and academics workers and therapists in the physical therapy field, and after informing them of the sources resulted in the use of exercises Correctional must for Aissahabha feeling pain or neither can the laboratory of performing any test, which is reflected on the results of that test or measurement For this work the researchers to develop a platform therapeutic never approach exercises rehabilitative purpose was to reduce the pain and inflammation, and the possibility of growth and activity of injured tissue to the extent can the laboratory of discharging his training first and second order does not make that severe injury and then be final does not allow the athlete to return to action for this researcher used a number of therapeutic means and identified according to the opinion of doctors and the type and severity of injury where identified casualties bruise muscle and tear muscular simple, medium, and the means as a blogger in below where experts identified four of the means used researcher from start treating the injury an hour and even start racing in the curriculum rehabilitative namely:

- Infrared (I.R).

- Cooling.

- Massage device (electric massage).

- Manual massage.

These methods have been developed in the curriculum and put timing as directed by doctors, as shown in Table (1) where the researcher explained the type of device used and the time and the number of units and unit time qualifying for people with treatment. Duration of the curriculum has been four weeks starting on 15/06/2014 until 07/15/2014 ranged therapeutic units of 4 units per week. As shown in Table (1).

**Table 1: build the distribution of physical therapy and the number of treatment units and periods per week for the period therapeutic:**

week	Means used type	Time therapy tool	full therapeutic units	Full therapeutic unit time	Number of sessions	Negative exercises
1-	IR + Manual Massage (with a negative superficial exercises) + (move the detailed working on the bone)	-20 -30d	4	15-30 min	6	Moving the joints that are working on movements
2-	Turasund + Massage Manual and mechanical + exercises positive	20min-3-min		15-60 min	6	Add 5 exercises cationic

The researcher took into consideration that precedes physical therapy doctor diagnose the type of injury and pain relief. With the rest of the injured part and submit it for the period (24-48 hours) and depending on the type and severity of injury. Rehabilitative approach:

Through the experience of being the authors Imarssonamlah training and inform them of the sources and expert opinions have been able to develop curriculum in the form of rehabilitation exercises are subject to the laws of sports medicine and sports science training curriculum implementation has rehabilitative dated 16/06/2014 until 07/16/2014 by four weeks, started in all four units a week, followed by qualifying on negative rest after every two units and thus the number of qualifying units (16) unit qualifying time of each unit (30) minutes and ranged between exercise intensity (30% -70%) of the viability of an infected person.

Results analyzed and discussed:

This section includes the results and analyzed and discussed, and the researcher presented the results analyzed and discussed according to the following:

### 3. RESULTS

**Display, analyze and discuss the results of measuring the degree of pain:**

**Table 2: shows the mean and standard deviation value (T) in the tribal tests and a posteriori the sample in the measurement of the degree of pain**

No	Variables	Pretest		Posttest		Mg f	Mg h2 f	T*	Significance
		C	A	C	A				
1	Measure the degree of pain	4.330	1.87	1.20	0.72	4.00	2.293	17.162	moral

\* Value (t) of tabular (2.201) under the level of significance (0.05) and the degree of freedom (7).

Display, analyze and discuss the results Mtaulp power in legs:

**Table 3 shows the mean and standard deviation value (T) in the tribal tests and a posteriori the research sample to test the degree of strength in legs.**

No	Variables	Pretest		Posttest		Mg f	Mg h2 f	T*	Significance
		C	A	C	A				
1	The degree of strength in legs	26.666	1.749	33.13	2.622	7.030	2.293	17.162	moral

\* Value (t) of tabular (2.293) under the level of significance (0.05) and the degree of freedom (7).

Display, analyze and discuss the results of the front femoris muscle strength:

**Table 4 shows the mean and standard deviation value (T) in the tribal tests and a posteriori the research sample in front of thigh muscle strength.**

No	Variables	Pretest		Posttest		Mg f	Mg h2 f	T*	Significance
		C	A	C	A				
1	Femoris muscle strength headlights	5.066	1.061	12.966	3.074	6.310	0.573	6.707	Moral

\* Value (t) of tabular (2.201) under the level of significance (0.05) and the degree of freedom (11)

Display, analyze and discuss the results of muscle strength femoral background:

**Table 5: shows the mean and standard deviation value (T) in the tribal tests and a posteriori the sample in the background femoris muscle strength.**

No	Variables	Pretest		Posttest		Mg f	Mg h2 f	T*	Significance
		C	A	C	A				
1	Femoris muscle strength background	6.720	3.241	12.090	1.015	-6.25	0.652	8.174	moral

\* Value (v) of tabular (2.201) under the level of significance (0.05) and the degree of freedom (7)

#### Discussion of Results

Through the search results and by reference to the table (2), we find significant differences in favor of the post-test in the degree of pain and attribute the researcher reason to therapeutic program as strengthen the muscles working through the use of his position exercises her do it on the surrounding leg ligaments by strengthening the muscles that have a direct impact in pulling the affected

ligaments and develop the strength of the muscles, which in turn increases the strength of the ligaments to enhance the stability of the muscles of lower limb

Infected, which is largely under pressure resulting from loads the training. Where the curriculum began to ease and use compresses cooling for 48 hours, three times a day then continued therapeutic approach through therapeutic means (infrared -waltraznd massage mechanical and manual), where the researcher used the program preventive treatment in order to restore the body to its natural state or are close to the body work of the ordinary as well as the renewal of the functional status of a member of the victim and here will these exercises on the "quick and easy entry into nerve signals by increasing the signal strength of the nervous" (Gustavsen, R; trouningther, 1985) this reduces the chance of reducing the pain and bring research hypothesis argument there therapeutic effect means selected according to the therapeutic approach to the research sample in tests posteriori.

Going back to the table (3), we find we find significant differences for post-test in the degree of strength in legs

Since the training vocabulary adopted by the researcher, caught up with the scientific basis used to determine the intensity required to develop muscle strength aggregates responsible for the performance of the basic duty motor, which led to an improvement in the degree of prescription strength to the muscles of the two men. Some studies have indicated that the development of Mtaulp muscle strength of the muscles working on the joints but reflect the strength of the ligaments that surround Bamufsal himself. (Rolf Wirhed, 1984: 67)

So Differences that emerged in these indicators for the post test a clear indication has shown the effectiveness of the exercises used in the qualifying program in the evolution of the degree of the relative strength of the muscles of the two men. These results have made the other part of the goal of imposing Find drafted researcher with regard to the special physical variables force.

Given the table (4), we find we find significant differences for post-test in front of thigh muscle strength

Researcher attribute reason, however, that the use of physical exercise rehabilitation, which is built on the basis of the gradient of negative action to affirmative action any work performance, and here each of Osama Riad consistent and in front of Hassan stellar and Ayoub and Ibrahim visual that "therapeutic exercises qualifying negative ones and positive is the most important natural branches treatment which are used in the treatment of injuries and then the evolution of the muscle towards increasing the bear "(Wadih Yassin, Yassin Taha, 1986) touched on the quality of the muscle by knowing the extent of what you can carry, or the degree of endurance them as well as how much they accomplish the job" (in front of Hassan stellar, Osama Riad 0.1998 any portion systolic which leads to inflation and increase the reserves of energy and materials in this muscle get the most as a result of the dynamic work.

Second, and produces an increase in fibrous membrane size in this case will reflect this increased the size of the elements responsible for the contraction of it is training to increase the maximum power and power will inevitably increase muscle size or enlarged muscle, but taking into account the performance time where most trainers reliable to develop strength muscle and then increase the inflation figure muscular output and the time it takes to accomplish (Job Ibrahim, Ibrahim Basri, 1992)

That the use of exercise training in a manner therapeutic science has helped in effect exercise towards increasing the work of the motor operating units and for adaptation nervous in the rotation of the muscle fibers do a developing nervous compatibility direction, which achieved Ttaiwirdrjh power level, especially since the researcher used the ring training method that has affected the level of tender The research sample and enhances it mentioned (Wadih Yassin and Yassin Taha) that the "circuit training aims to fitness, especially the elements of power and the degree of strength, flexibility and agility" build any would this work flow of blood newcomer tissues working where mentions Osama al-Tai for (Peterson, and Rnstrom) that "muscle processed about 15% of gross tribal at rest while preparing b (72%) of the gross tribal during muscular work" (Joshua Haitham, 2002).

For the purpose of moral knowledge differences between pre and post tests of muscle strength femoral background, the researcher using the test (T. test) for the corresponding samples, as shown in the table (5). We find that the player injured was a need "to increase the intensity and the amount of the job done for the development of maximum power with emphasis on the importance of the size of the resistance used and attention mighty point impact and direction and the amount of tensile longitudinal muscle as well as the contact point tendon and its relationship with Arthritis" (Resan Kahriht glorious 0.1991) and has thus achieved Find all targets.

#### 4. CONCLUSION

1. The Qualifying Program prepared developed muscle strength of the muscle groups working on the muscles of the lower limb of the basketball players (youth)
2. No statistically significant differences between tribal and dimensional tests for the research sample of indicators for reducing the degree of pain
3. No statistically significant differences between tribal and dimensional tests for the research sample of indicators for the development of strength to the muscles of the two men.
4. No statistically significant differences between tribal and dimensional tests for the research sample of indicators for the development of muscle strength femoral front
5. The existence of significant differences between tribal and dimensional tests for the research sample of indicators for the development of femoral back muscle strength.
6. Exercise contributed to the severity and frequency and the number of sessions in the muscles ready to withstand voltage after muscle injury.

## 5. REFERENCES

1. In front of Hassan stellar, Osama kindergarten; sports medicine and physical therapy: Cairo, book publishing center, 1998
2. - Inam carpenter; a proposal to rehabilitate the muscles of the trunk program after acute spinal injuries, Master Thesis, Faculty of Physical Education, University of Baghdad 0.1996.
3. - Ayub Ibrahim, Ibrahim al-Basri; articular and muscular football: Baghdad injuries, Dar Al-Mansour for publication and distribution 0.1992.
4. - Abul-Ela, Mr. Abdo; the role of the coach and the player in sports injuries: prevention and treatment, Youth University for printing and publishing and distribution Foundation, Alexandria, 1984
5. - Rushdie Fattouh Abdel-Fattah; The basics of science in general Afassiologih (Cairo, Dar chains 0.1998)
6. - Smiep Khalil Mohammed; Sports therapeutic, Baghdad, Dar al-Hikma Press, 1990
7. - Mufti Ibrahim; Alndreb sports talk, i 1 (Cairo, Dar Alvkr 1998)
8. - Wadih Salman, Nashwan yolk; Sports injuries suffered by the Physical Education students at the University of Mosul, Iraq Alaadih Journal of Science, Vol. IV, No. X, (Mosul University, 1998)
9. Hassan Alnoasrh; Injuries ankle ligament rupture in their relationship and in some physical measurements and anatomical foot, scientific studies of the Fifth Conference of Physical Education, Research, (Egypt, Helwan University, Faculty of Physical Education).
10. - Mukhtar Salem; Sport injuries, i 1, (Riyadh, Reich Publishing House, 1987),
11. Match is required; Back pain and neck and back and sweat Agency, (small encyclopedia, number (298), Iraq, House of Cultural Affairs, 1988)
12. - Ammar bottomed; Sports Medicine, (Mosul, National Library for printing and publishing 0.1999.
13. - A. Parham; muscle injuries (Olympic Committee, Federation of Sports Medicine, 1993)
14. - Mukhtar Salem; Sport injuries, i 1, (Riyadh, Reich House Publishing, 1987).
15. - Ahmed Mohammed Abdul Khaliq; the impact of a proposed curriculum for the treatment of lower back pain by strengthening the muscles of the thighs, Master Thesis, Faculty of Physical Education, University of Baghdad 0.2004.
16. - Haitham Joshua; Technology rehabilitation program according to some biomechanical indicators for the rehabilitation of injured partial tear of the lateral ligament and the medial in the knee joint, PhD thesis: University of Baghdad, College of Physical Education 0.2005.
17. - Wadih Yassin, Taha Yassin; physical development of women: Mosul University, National Library for Printing and Publishing, 1986.
18. Mohamed Sobhi Hassanein; Measurement and Evaluation in Sports and Physical Education, vol. 1, 3rd Floor, (Cairo, Dar Al Arab Thought 0.1995).
19. Larry, F, Ellison: Basketball Injures in the database of the Canadian
20. hospitals injury reporting and prevention program (CHIRPP), chronic Diseases in Canada, (1995) ,
21. Dorothy. , Marjorie; Proprioceptive neuromuscular copy right. Co, 3rd , 1985
22. Abbott H.G. and kress g. Archires of Physical medicine and Rehabilitation, New York University , 1999.
23. . Gustavsen, R; trouningther ; cstuttgatt, new york time, inc, 1985 .

## 6. APPENDAGES

### 1: training curriculum

week	Number of units	Intensity	Repetition	Rest between iterations	Totals	Rest between aggregates
First	3	40%	10	2 min	3	4 min
Second	3	55%	10	2 min	3	4 min
Third	3	65%	10	2 min	3	4 min
fourth	3	75%	-1	2 min	3	4 min

Notes training curriculum:

1. Repetitions in the first week (15) and the number of aggregates 4.
2. Repetition in the second week (15) and the number of aggregates 4. Thus, for the rest of weeks.
3. Intensity begin with (40%) and ending with (80%) as sources indicate.
4. Rest period cured up to a period of 6-7 minutes is very adequate for the youth players.
5. Intensity in the first week and the second 40%.

Unity qualifying model

Illustrates the physical attributes to be measured and the proposed tests

Correctional units divided weeks

First week:

Time: 45 minutes

Part prep: 10 minutes

The main part: 35 minutes

Final part: 5 minutes

week	Exercises used	Time	Intensity	Repetition	Rest between iterations	totals	Rest between aggregates
first	<ul style="list-style-type: none"> <li>- Lying on the back with the lifting of the two men in tight alternately to the top and bottom</li> <li>2. Lie on your back with legs alternately lifted and rotated to the right and the left.</li> <li>3. Lie on your back with legs alternately lifted and rotated to the right and the left, writing for the number (5).</li> <li>4. Lie on your back with legs alternately lift to the top.</li> <li>5. sit on the bench with the lifting of the two men together, a fully outstretched.</li> </ul>	90 sec	40%	3*15	2 min	3	4-4 min

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# THE IMPACT OF COMPARATIVE COMPETITION METHODOLOGY TO DEVELOP SOME FLOOR EXERCISES AND DEVELOPMENT OF INTELLECTUAL FLUENCY FOR KINDERGARTEN CHILDREN

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## Abstract

Through the researchers' visit and follow up for some Kindergarten and they have access to the general curriculum and their Physical Education classes and study learning modules and items contained in their program, they noticed that there is a problem lies in the poor performance of some of the basic kinetic level and their thinking abilities haven't been shown during the lesson, and they diagnosed that this weakness is due to not using the main components of the kinetic educational curriculum (kinetic story, simple exercises, small games) during the lesson, as well as the need for learners to far from the traditional style methods away boredom from them and increase their motivation to develop and show their creativity in the lesson one of them is the competition with each other, competition is an important and necessary motive in increase and development of individual's skills and abilities, and for the aforementioned reasons, the research problem appeared and the idea of trying to solve it by development of the kinetic educational curriculum has a kinetic stories and competitive games for the development of the basic movements, development of thinking fluency, and learning of floor exercises. And Research goal To identify the performance level of the floor exercises (Forward roll rings - Forward roll opened - Forward balance) and intellectual fluency on (Al Rahman) national kindergarten children for the academic year 2012-2013, Results and Discussion Results' review and discussion of floor exercises and intellectual fluency pro- and post tests and The program achieved a development in the floor exercises when comparing the pro- and post testes, The comparative competition method is an effective method in the improvement of the performance skills level of the movement in the research and with different percentage.

**KEYWORDS:** Methodology. Fluency. Kindergarten

## 1. INTRODUCTION

The kindergarten stage is a purposeful educational stage as important as other stages, it is a distinct educational stage, and immanent with its educational philosophy, behavioral goals and educational Psychology. Kindergarten based on aims including children resume respect when they play their games, and that many children prefer to play with a colleague in order to compete with him to overcome him and win, and this is what made educators recommend using comparative competition method, which based on the distribution of children in t groups, each group contains (two children) working in competition style.

Modern Education stands its basics and principles on the pillars that every person has abilities that must be disclosed and put its developing programs in the right direction, an educational movement called (Education for Creativity) has emerged (Lamia Hassan Aldiwan, 1999.36). It was necessary that it includes the children in the kindergarten age, and to activate the views of this movement it has to put the prepared programs according to guidelines in line with children needs at this stage, because the child, he can not grow unless he plays and moves his body using his muscles and joints through running, jumping, climbing and partridge.

The researchers developed a curriculum in a comparable compete method where every child is competing with his colleague contain purposeful kinetic stories, they learn trough it the basic movements, through storytelling for children they are asked to think about the stories titles or names that fit the told story and thus develop their intellectual fluency.

Many of people see that Gymnastics Sport is the young aged sport, the Eastern school confirms that the selection must be of pre-school age in any of the (4-5) years, after that the fledgling undergoes for a period ranging from one year to two years of introductory programs belong to the sport practicing (Adel Abdul Basir and Fawzi Jacob: 1985.187), and within the ongoing adjustments from Periodic Union in obligations necessitate that teenager must participate in his first official tournament at (9 years) boys and (7 years), and so a lot of sources indicated, the need for education of floor exercises for children early

**Research problem:** Kindergarten is one of the important scientific institutions in society that contribute to the education of children of various sciences and simple knowledge that help him when he entered the school, to become a productive man in the future, kindergarten provides an educational environment exciting for his abilities and commensurate with his mental maturity and his interests at this stage, and Education kinetic for children is very necessary and it's an purposeful educational method is achieved by using movement, and aims at the same time to learn the different movements and skills "and through the movement can stimulate and challenge the child's intellectual and cognitive abilities " (Samira Taleb Sultan al-Rubaie: 2005.20).

Through the researchers' visit and follow up for some Kindergarten and they have access to the general curriculum and their Physical Education classes and study learning modules and items contained in their program, they noticed that there is a problem lies in the poor performance of some of the basic kinetic level and their thinking abilities haven't been shown during the lesson, and they diagnosed that this weakness is due to not using the main components of the kinetic educational curriculum (kinetic story, simple exercises, small games) during the lesson, as well as the need for learners to far from the traditional style methods away boredom from them and increase their motivation to develop and show their creativity in the lesson one of them is the competition with each other, competition is an important and necessary motive in increase and development of individual's skills and abilities, and for the aforementioned reasons, the research problem appeared and the idea of trying to solve it by development of the kinetic educational curriculum has a kinetic stories and competitive games for the development of the basic movements, development of thinking fluency, and learning of floor exercises.

**Research Aim:** To identify the performance level of the floor exercises (Forward roll rings - Forward roll opened - Forward balance) and intellectual fluency on (Al Rahman) national kindergarten children for the academic year 2012-2013.

**Research hypothesis:**

1. The existence of moral significant differences between pretest and posttest results for some floor exercises for kindergarten children.
2. The existence of moral significant differences between pretest and posttest results for intellectual fluency among children.

## 2. MATERIAL AND METHODS

- Researchers used the experimental method because of its seemliness and the research nature.

**Research population and sample:**

- The research population consists of (Al Rahman) national kindergarten children for the academic year 2012-2013 aged (5-6) years old, 12 children were selected from the total number (22) children with 54% percentage.

**Research field procedures:**

- Determine floor exercises and appropriate tests of it:  
A set of floor exercises has been shown on a group of experts and the following exercises were selected (Forward roll rings - Forward roll opened - Forward balance)

- **Perspective experiment:**

It is a survey for the circumstances surrounding the phenomenon that the researcher wants to study and it's "initial pilot study carried out by the researcher on a small sample before carrying out his research in order to choose the research methods and tools" (Arabic Language Academy: 1984.79), and get to know some of the negatives and the obstacles that may facing the researcher while she was doing the main experiment.

- **The first perspective experiment:**

The first perspective experiment was conducted to apply an educational unit of the program in order to determine how long it takes each test and the appropriation of the exercises to the age of kindergarten children.

- **The second perspective experiment:**

The first perspective experiment was conducted to test the intellectual fluency of children (Lamiaa Hassan Aldiwan, 1999, 118) in order to know the children understanding of the accepted and appropriate responses of the story and the duration.

- **Floor exercises performance level measurement:**

Floor exercises have been arbitrated (Forward roll rings - Forward roll opened - Forward balance) by three arbitrators and the total score for each movement was (10 degrees) the three degrees of arbitrators were collected and extract its arithmetical mean.

- **Validity and reliability and objective of tests:**

"Validity means the extent which by it, the test or any other variable achieves its purpose which it was intended for." (Ali Salloum Jawad: 2005.102), and valid testing is that one which capable of measuring the thing which was designed to measure (John W. and William: 1966.19), and to find the validity of their tests, researchers extracted the self-honesty and so, true scores for the test are considered the balance (this honesty is called honestly balance) attributed to it test's validity. Since stability is in essence based on the correlation coefficient of the test's real grades itself if the test is redone on the same a group of individuals that takes the test the first time (the subject of stability in a way of re-test), then there is consistency relevant between the re-testing way and self-honesty. Self-honesty is important because it gives an idea of the other types, such as experimental validity, factor validity with the observation that self-honesty is often higher than experimental validity, factor validity in value

Objectivity character is one of the characters of the test rather it's one of the scientific basis for good test. We have identified the objectivity in the field of measurement as a match of the views of more than good when we evaluate the test (Qais Nagy Abdul-Jabbar, Bastawisi Ahmed: 1984.175)

Test must have a high degree of objectivity, with no matter about the evaluators view, with the assumption that the arbitrators in the test are equal in efficiency and rehabilitation, the test is considered to be objective as being stable, so as Resan Kahribt (1989) confirms that whenever reliability coefficient is high, it leads to an increase in the objective coefficient and vice versa (Resan Kahribt Majid: 1989.20)

**The pro-tests:**

The pro-tests was implemented by using the floor exercises tests for one day Monday 18/2/2013, and intellectual fluency test was implemented on Tuesday 19/2/2013, and all conditions such as place and time have been stabled, the method of applying the program units (20 units) was for (10 weeks) as 2 units per week each module takes 30 minutes.

**The Educational program:**

A program related to the kinetic games has been set (Appendix 1) aimed to teach and develop the floor exercises for kindergarten children aged (5-6) years old, the lesson included (kinetic story and small games). The program was applied on the sample members with two modules per week, each module takes 30 minutes, and the program applied started Wednesday 20/2/2013.

**The post tests:**

The post tests was implemented after the applying of the educational program in 5/5/2013, in it floor exercises and intellectual fluency were tested.

### 3. RESULTS AND DISCUSSION

Results' review and discussion of floor exercises and intellectual fluency pro- and post tests:

**Table 1: Shows the Means, standard deviations, the differences means, standard false value, (T) calculated value, and the statistical significance of the pro- and post tests of the comparative competition group in the research variables**

No	Variables	Pro-tests		Post tests		the differences means,	standard false value	(T) calculated value*	statistical significance
		M	S.D	M	S.D				
1	Forward roll rings	3.80	0.41	8.26	0.70	4.46	0.19	23.27	Moral
2	Forward roll opened	4.66	0.89	8.40	0.63	3.73	0.34	10.83	Moral
3	Forward balance	4.13	0.99	8.40	0.63	4.26	0.33	12.91	Moral
4	Intellectual fluency	1.60	0.50	4.80	0.56	3.20	0.22	14.37	Moral

\* (T) Tabular value is under the statistical significance (0.01) = 2.624

The results showed that there are differences in the pro- and post tests of intellectual fluency, in the pro-test the arithmetic mean was (1.60) and standard deviation (0.50), while the arithmetic mean of the post test has reached dimensional (4.80) and the standard deviation was (0.56) the difference of means between pre and post tests has reached (3.20) under the standard false (0.22). In order to identify significance differences between the two tests the results were treated by (T) test and it was found that the calculated value of (14.37) which is greater than the value Tabulated of \$ (2.62) below the false value (0.01), and this indicates the presence of significant differences for the post test.

**Post tests results discussion of floor exercises and intellectual fluency:**

The researchers attributes reason for improvement in the floor exercises in the post (Forward roll rings - Forward roll opened - Forward balance), that this type of competition that is between the two of learners has created a great incentive to perform because the presence of the opponent make the child is serious about overcoming difficulties he faces during the performance (Forward roll rings - Forward roll opened - Forward balance), so he tries to correct his mistakes to overcome his peer because the child by his nature have the desire to win when the activity is in the form of his opponent (ie, who the best in performance), and this is what made each child trying to overcome the obstacles faced his performance in order to achieve his place by beating the opponent as (Murray) mentioned, "The need for achievement if it was strong, the individual will try to do a difficult and arduous acting even to show his ability in dealing with business and organizing associated ideas and thus accomplish this quickly and in an independent way as much as possible. (Adib Mohammed al-Khalidi: 2003.215)

To continue to learn the floor exercises in this way to makes the child try a new approach and believed that the colleague, who in front of him despite being deducted and competitor but he must learn from him and correct his mistakes in order to arrive together to the best performance when it is to be compared to either compete to exert maximum effort and best performance.

The fact that the comparative competition is better in the post results in intellectual fluency, attributed to what the program contained of stories and games contributed to the development of fluency through its contribution to provide children with information based on the competition between two children has made both has benefits of the information and ideas contained in the minds of both of them to resolve the duties required in the story and banished the boredom that may occur during the performance and gave them a chance to explore to get to the most appropriate ways of kinetic performance commensurate with their kinetic abilities and individual preparations and abilities.

### 4. CONCLUSIO

1. The program achieved a development in the floor exercises when comparing the pro- and post testes.
2. The comparative competition method is an effective method in the improvement of the performance skills level of the movement in the research and with different percentage.
3. The used fluency test can improve the intellectual fluency of the kindergarten children.

## 5. REFERENCES

1. Adib Mohamed Alkhalidy: The psychology of individual differences and mental superiority, 1st ed., Dar Wael for publication, Amman, Jordan, 2003.
2. Rysan Kharbit Majeed, The encyclopedia of testing and measurement, 1<sup>st</sup> part, 1989. P20.
3. Saeb Atya, Abdelsalam Abdelrazeq, The scientific and Educational bases of gymnastic Movement, Bagdad press, The Ministry of Higher Education and Scientific Research, 1997.
4. Adel Abdelbasir and Fawzy Yaqoup: : Theories and scientific bases in the gymnastics training, Dar al-Kitab Al-Hadeth (the New Book), Cairo, 1985, P187.
5. Adly Housin Bayoumy: The artistic collections in the Floor Exercises, 1<sup>st</sup> ed., Saudi Arabia, 1998.
6. Afaf Osman, The recent trends in the kinetic Education, Dar AlWafaa for printing and publishing, 1<sup>st</sup> ed., 2008.
7. Ali Salum Jawad: Testing and measurement in the sports field, Qadisiyah, 2005.
8. Qais Naji Abdul-Jabbar, Bastawisi Ahmed. Tests and statistics principles in sports field. Faculty of Physical Education - Baghdad University, Baghdad University Press, 1984.
9. Lamia Hasan Diwan: The Impact of using of two teaching methods for development of public and kinetic creative abilities in physical education lesson to the pupils of the fifth grade. PhD thesis, University of Basra, Faculty of Physical Education .1999.
10. Lamia Hasan Diwan: The impact of a curriculum for development of kinetic fluency and development of agility, balance and kinetic satisfaction in Physical Education lesson, Physical Education Science magazine, Faculty of Physical Education, Babel University, first volume, third tome, 2004.
11. •Mohamed Abdel Moneim El-Shafei: The Art of Floor exercises, 1<sup>st</sup> ed., Al-Ahram Press, Cairo.1971.
12. Maeoff Zanon Hantoush, Amer Mohammed Saudi: The entrance to the base movements of men gymnastics, the Directorate of National Library for printing and publishing, Mosul, 1988.
13. Arabic Language Academy; glossary of psychology and education. 1<sup>st</sup> part: (Cairo, Public Authority for presses AlAmirya, 1984).
14. John. W. and William, standards for educational and psychological and tests and manuals. Washington, American psychological association, Inc, 1966 P.19.

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# THE IMPACT OF NON- OXYGEN PHYSICAL EFFORT TO CHANGE SOME OF THE SALTS OF THE BLOOD AND THE ACCURACY OF SOME TYPES OF CORRECTION BASKETBALL FOR MEN

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## Abstract

Impact of physical effort unaoxigini to change some salts of blood and some types of correction basketball for men

The basketball game from games that require and need aerobic and anaerobic indicators measure the reverse efficiency of physical preparation and development achievement .The researchers headed to the shed Physical effort and unaoxigini effect in changing some blood and salts (calcium, potassium, sodium) and a precision shooting skills in basketball players Mustansiriyah University basketball team.

We used descriptive research sample consisted of 10 players from the squad as selected Mustansiriyah University deliberately researchers applied a training effort anaerobically was Kiss measuring salts of potassium, calcium, sodium and strictly anaerobic workouts then applied correction, and the researchers concluded The concentration of salts in the blood plasma were within normal limits in both the MRDS and tribal walbadi sample research and increasing the concentration of salts is directly proportional with the amount of sweat suit is lost. The researchers recommended that functional and chemical tests for legalization and building training programs in addition to other variables and the need to use functional tests and chemical Straighteners training status.

**KEYWORDS: Non-oxygen. Salt .Blood. Basketball.**

## 1. INTRODUCTION

Basketball game an accredited Olympia mass games that require exercise performance skills of high requirements and performance and accurate mass and follow the tactical ways accredited aspect of physical and role of senior and important during the games, especially when the level is a close between the players of both teams contenders in the tactical and technical skills aspects through continuous training exercise special which is similar to the cases of play, taking into account the gradient in order to ensure absorption of the players have been good and ensure harmony physical performance and skill and the level of training to withstand fatigue and speed of performance in the circumstances and situations that require it while retaining their ability skills and mental abilities on the realization of the matches in the same endurance capacity. As well as knowledge of the weaknesses and strengths of the players of the opposing team and their ability to act in the positions of variable play and dissuade fatigue.

The correction by jumping from the more commonly used types of correction to the fact that basketball player performed to get rid of guns using the jump and then correction. The balance of the key factors for the success of this type of correction, this skill depends mainly on the strength of vertical jump at the player scorer and the extent of its focus and its potential to avoid the defender, who is in a state jumped with him, however, the "strength jumped scorer and height depends on the length of the guns and the high jump and the extent of his reaction towards the top scorer of the movement and its distance from the basket."(1). In all cases, if the correction of jumping or stability we can achieve through two points if the shooting from inside the arc of the three points, and we can achieve three points if convicted of shooting from outside the arc, and is aiming to jump one of the most effective offensive weapons due to its gameplay defensive adjacent continuously during the games (Red Holman and Leonard 1972 Lewis (the performance of this skill can be the status of stability, or after the end of the performance of another movement, the movement will be after the end clapotement (conversation) or after receiving the handling of the colleague of movement or after fooling followed by scoring movement (Mohammad Abdul Rahim 1995). For this, the skills development associated with the functional capabilities of each player so the body was able to continue the physical performance, and form the metal and one of the basic materials needed by the body to complete the salts jobs physical accurately, such as sodium chloride and iron in the blood (Brian Coleman 1995) . in addition to the presence of mineral salts in the body small quantities because they are vital operations of a great importance in the body needs a lot of elements such as: - sodium, potassium, iron, calcium , magnesium, phosphate because of its important functions that enters the installation of the body's cells, and the formation of red blood cells, and regulate the heart rate and achieve the acid balance of the body, as well as it helps in the osmotic pressure of the cells and body fluids stability. It is noteworthy (1984, david r. Lamb) body loses about (1-5 liters) of water in each module as a result of out of race who siphoned off him about (1.5 - 8), sodium, and the loss of sodium and potassium may cause shortages Muscle Spasms (Ibrahim of sugar et al. 2003). For this is the importance of research to find out the effect of non-oxygen physical effort to change some of the salts of the blood (calcium, sodium, potassium) and its impact on the performance of some skill correction basketball .search goals to know the effect of non-oxygen physical effort to change some of the blood salts such as (calcium, potassium, sodium) with the players team Mustansiriya University basketball. And some accurate shooting skills of basketball.



**Research Hypothesis:**

1. There are significant differences between tribal and dimensional measurements in some blood salts in a sample search members
2. There are significant differences between tribal measurements and dimensional accuracy for certain types of correction basketball.

**2. MATERIAL AND METHODS**

The researchers adopted a descriptive approach Society and the research sample represents the research community ten players from the team Mustansiriya University basketball men who represent the research sample, has been chosen the way intentional, and they represent 80% of the original community.

Tests and measurements used in the research:

Anaerobic power tests (Falah Hassan, 2008)

**First test:** - Koonjham and Vlawkins test

**Second test:** measuring the ability to delivery and clapotement (Interviewing high) ended

Peaceful correction. (Sammy Knight 2006)

**The third test:** Measuring the proportion of mineral salts in the blood: the blood is withdrawn from the sample before the performance physical effort and are modeling after blood tubes withdrawn, and then the laboratory performance of physical effort, and upon completion of the effort pulls him to the blood sample and also placed tubes and then isolating serum (serum) from for the necessary tests .oetm measure the concentration of calcium, potassium and sodium content in the blood ratio.

Main experience: the researchers conducting the President of experience to search on 11/20/2014 at ten o'clock in the morning and took into account the researcher same circumstance in which the exploratory experiment was conducted, where the Assistant Team conducted a tribal tests of salts and accurate scoring tribal under study for the research sample were taking blood samples for players by (5cc) and then placed tubes and then you make anaerobic physical effort (Konnenjham and Volkz test), which measures the anaerobic capacity, where the players make a proper warm-up on the machine for the duration of (5-10) minutes, and then the device (14 km / hour) and the degree of Milan 11 degrees to climb after the other player on the device to the test as he got off and made the process of drawing blood and then placed in test tubes and then scoring accuracy performance.

**3. RESULTS AND DISCUSSION**

**Table 1: shows the circles and standard deviations and the value (t) calculated and tabular variables search effort before and after the effort:**

No	Variables	before		after		(T) value		level of significance
		C-	A-+	C-	A-+	Calculated	Error level	
1	Potassium	4.05	0.48	4.36	0.46	3.80	0.030	Moral
2	Sodium	133.2	16.19	146.40	13.69	1.837	0.000	Moral
3	Calcium	8.65	0.46	9.65	1015	2.82	0.010	Moral
4	Correction jumping	6.72	0.66	5.85	0.65	1.819	0.072	Not significant
5	Correction peaceful	6.01	0.76	4.78	0.71	1.73	0.130	Not significant

df (9) below the level of significance ≤ (5%)

Condoles researchers individual differences moral to increase fluid loss process, especially sweating during high physical effort intensity, leading to an increase in the concentration of salts in the blood plasma but remain within normal limits, and the excess of the case satisfactory, which is consistent brought by each of the (Saad Kamal Taha and others in 1988 ) (Ahmed Ali Hassan al 1990) in studies and research they conducted and concluded to increase the proportion of salts in the plasma volume after training at high intensity.

This view emphasizes the experiment conducted by the (wilkerson) on fixed degree temperature (30 ° C) in the time period of (20 minutes) and the types of distress are (30% -45% - 60% - 75% - 90%) received a researcher in the significant differences on the concentration of calcium in the intensity (90%) only, and did not get on the significant differences in other Bbakh Cdd. As the user's physical effort by the researchers will arrive to level the maximum intensity, which means the agreement results and this is consistent with his findings Abul-Ela Ahmed Abdel Fattah (1985) and Ahmed Ali Hassan (1990) that the increase in the concentration of potassium linked directly proportional to the intensity of the exercise, due to increase focus to the electrical activity of the muscle force during training. And further agree Search with what brought him Results (Huda Badawi 2009) The moral differences for each of Potassium, sodium and calcium variables due to high internal temperatures by the resulting chemical reactions and different degrees of heat generated in the intensity of training load and the length of time of the performance, where the higher the intensity high heat load was faster production and thus it was necessary to get rid of the heat produced by the work of sweating, which is one of the physiology mechanisms for the disposal of high-temperature (Huda Badawi, 2009)....

This was confirmed by (Rafe Saleh et al. 2008), causing more loss of fluid from the body through sweating, which leads to raising the amount of sweat glands of (2-3 million) ethnic gland on the surface of the skin so it is considered one of the most efficient mechanisms of heat loss through physical activity in hot weather about the test. As the correction of the colon and a jumping test correction peaceful results have been insignificant and researchers attribute this to the increase of salts in the blood has led to the

emergence of fatigue causing a negative impact on the basketball shooting accuracy. This is consistent with the view of many scientists.

#### 4. CONCLUSION

- 1- The concentration of salts in the blood plasma were within normal limits in both the two measurements and pre and post in a sample search.
- 2- Physical effort anaerobic affect increase the concentration of salts in the blood Plasma.
- 3- To increase the salt concentration is directly proportional to the amount of sweat that is lost.
- 4- The increase in the concentration of salts in the blood may impact negatively on the basketball shooting accuracy.

#### 5. REFERENCES

1. Lifter Fathi Saleh and Ali Hussein Ali; theories and applications in the science of sports physiology, Baghdad, 2008, p. 177.
2. Saad Kamal Taha and others; the impact of long-day training program on plasma volume and pH in plasma and urine concentrations of sodium ions and Albotasim in Albulama, Cairo, 1988, p. 75.
3. Ahmed Ali Hassan; comparative study, the effect of general and partial massage on some variables physiology of the athlete, his doctoral dissertation, Faculty of Physical Education for Boys, Cairo, Helwan University, 1990, p. 66.
4. Abu Ela Ahmed Abdel-Fattah; the source of the foregoing, Cairo, Faculty of Physical Education for between 0.1985, p. 75.
5. Huda Badawi Shabib; the impact of a variety of training loads on the warm atmosphere of the concentration of some mineral components of blood to the difference Athletic Games for men and women, Arouhh Ph.D., University of Baghdad, College of Physical Education, 2009, p. 176.
6. Sammy Knight; building and rationing battery test to measure some offensive skills composite basketball for young people, doctorate thesis, University of Baghdad College of Sports Education, 2006, p 117.
7. Falah Hassan Abdullah al-Khafaji; the effect of anaerobic training in the efficiency of some vital organizations and variables for the development of lactic Albyukimaaúh for basketball players, doctoral thesis, University of Babylon, Faculty of Physical Education, 2008, p. 87
8. Wilkerson j. e. and others; plasma electrolute cant and concentration during tead mall exercise in humans. J. appl. Physiolojis. Environ exercrse physiology.

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# THE IMPACT OF THE INTERFERENCE OF SOME EXERCISE METHODS IN LEARNING THE STUDENTS TWO SKILLS OF HANDLING AND PEACEFUL SCORING IN BASKETBALL.

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## **Abstract**

1- Recognize the impact of some overlapping educational exercise methods in learning the skills of handling and peaceful scoring in basketball.

2- Recognize the best method for training in learning the skills of handling and peaceful scoring in basketball. The search society is determined in the students of the first stage in the faculty of physical education- Diyala university in the school year 2013-2014 who are 189 students distributed on four experimental groups thus on the exercise methods thus each group represents a method. Each group includes 15 male students per each group thus the total of the search sample will be 60 students. This number represents a percentage of 31.75% of the search society and it is suitable for representing the society honestly. The female researcher used the Statistical package SPSS for processing data and getting the results from the used methods (the mathematical mean, the standard deviation, T test for the independent samples and the variance analysis). The female researcher has reached the following results:

1- The interference process between a numbers of exercising methods affects greatly and effectively on learning the skills of handling and peaceful scoring in basketball.

2- There aren't any significant differences between the used exercise methods in learning the skills of handling and peaceful scoring in basketball between the dimensional tests for the four search groups.

**KEYWORDS:** The exercise methods. The handling. The scoring and the overlapping methods.

## 1. INTRODUCTION

The basketball is considered one of the team sports which witnesses major development by the good performance for the main skills of the game. Certainly the favor in it is due to use the modern scientific methods for learning these skills whether these skills were Offensive or defensive. This development makes basketball one of the important team sports in the world. It is practiced in various countries of the world. It concerns a lot whether of the athletes or the non athletes. The cause of it is what this game includes of excitement, suspense and performance characterized by beautiful harmony between the performance force and the movement speed which show a wonderful total performance. The most important and beautiful skills are the two skills of handling and peaceful scoring because of what is added of enthusiasm and suspense in the game.

The exercise and its organization is one of the important and due matters in the educational process as it achieves large share of interest for those who are concerned with the educational process because it contributes positively to achieve variation in the used exercise and its implementation methods rather than facilitating the education process and keeping the skills taking into consideration the difficulty or the ease of the skill to be learned by the graduation and following the organization in exercise methods when performing the skills. The exercise organization and using the scientific methods for its distribution from investing the educational methods and its intervention is the scientific approach which aims to raise the educational level, to achieve the educational process objectives effectively and to make these methods suitable for the learner's desires and tendencies for achieving additional educational experiences. Different and several educational methods are found because of the major differences in the motor skills thus choosing the educational method should be suitable for the skill to be learned and the students potentials.

The female researcher depends in this search on the interference principal between the educational methods by using the interference between the serial method in both the total and partial method and also the fixed and variable method in learning the handling and peaceful scoring in basketball, organizing the interference process consistently and following the proper planning in the interference process between the learning methods.

The research importance lies on finding new methods of interference between the exercise methods and identifying the best methods of the learners and providing suitable and meaningful learning opportunities which serve the educational process.

**Research problem:** The learning methods are considered one of the most important sides in the educational process success which is achieved by the interference between the educational process sides which are the teacher, the learner and the educational curriculum.

Through the female researcher experience in teaching and her observation for several methods in teaching, she found that there are some methods which don't achieve the desired benefit in accelerating the education when using it unilaterally. So the possibility of innovating new methods are the ideal solution for moving away the traditional methods and also the cause

of choosing the female researcher for the two skills of handling and peaceful scoring as two skills which hope for achieving the benefit in its learning thus perfecting its performance.

**Research two aims:**

- 1- Recognize the impact of some educational overlapping methods on learning the two skills of handling and peaceful scoring in basketball.
- 2- Recognize the best method for exercise in learning the two skills of handling and peaceful scoring in basketball.

**The research two hypothesizes:**

- 1- The interference of some exercise methods has a positive impact in learning the two skills of handling and peaceful scoring in basketball.
- 2- There is no preference between the interference of the used exercise methods in learning the handling and peaceful scoring in basketball.

**2. MATERIAL AND METHODS**

**The research approach:** The female researcher used the experimental approach (the equal groups) as it is compatible with the nature of the research problem which is considered one of the most adequate methods for reaching a reliable knowledge. (Van Daleen, 1985, P.407)

**The research society:** The research society is determined by the first stage students in the faculty of physical education-Diyala university in the scholar year 2013- 2014 who are 189 students distributed on five scholar sections.

The sample is chosen deliberately from the research society. It is consisted from the two sections A and B which are divided into four experimental groups. Thus the exercise methods which represents a group for one of the methods which is consisting of 15 students per each group thus the total number for the research sample will be 60 students. This number constitutes a percentage of 31.75% of the search society and it is a suitable percentage for representing the society a reliable representation. Table 1 shows that:

**Table no. 1 shows the number of the sample members according to the eighth groups:**

The groups	The exercise methods	The number per the group	The sample's percentage
The first	The fixing partial serial	15	31.75%
The second	The variable partial serial	15	
The third	The fixing total serial	15	
The fourth	The variable total serial	15	

**The research groups equality:**

Before starting in applying the educational approach, the female researcher should form equal groups at least with regard to the variables related to the research (van Daleen, 1985. P 398). The equality process has been done between the groups using the statistical method for analyzing the variance of the search variables.

The equality in the variables related to the gross measurements

- The Chronological age is measured by the year
- The length is measured by the centimeter.
- The body mass is measure by Kilogram.

As indicated in table 2.

The statistical parameters for the variables	mathematical mean	variance sources	deviations	df	variance	calculated F value	significance type
The work/ year	21.73	between the groups	13.70	3	1.957	0.457	random
		Inside the groups	309.3	56	4.295		
The length/ cm	175.66	between the groups	0.00359	3	0.0005	0.159	random
		Inside the groups	0.23409	56	0.0032		

The body mass/ kgm	65.89	between the groups	143.09	3	20.441	0.314	random
		Inside the groups	4679.9	56	64.998		

Table 2 shows that the calculated F value for the variables of age, length and the body mass is less than F tabular value of 2.85 at significance level of 0.05 and two free degrees of 56.3 thus the differences will be random between the four search groups which yields the equality between them in these variables.

**The equality in the skill tests:**

**Table 3: shows the equality of the four search groups in the skill tests**

The statistical parameters for the variables	variance sources	deviations	df	variance	calculated F value	significance type
The handling test	between the groups	28.467	3	9.489	1.462	random
	Inside the groups	363.467	56	6.490		
The peaceful scoring	between the groups	2.267	3	0.756	0.508	Random
	Inside the groups	83.333	56	1.488		

Table 3 indicates that the calculated value of F for the tests of performance handling and the peaceful scoring in the basketball is less than the tubular F value of 2.85 at the significance level 0.05 and two free degrees of 3, 56. Thus the differences will be random between the four search groups which yields the equality between them in these variables.

### 3. RESULTS AND DISCUSSION

The most important matters that should be provided in the scientific researchers are the tests that are considered the most important methods in the life fields generally and the education field particularly because of because of its progress in the last years (Kais Nagy and Bastawesy Ahmed, 1984:12)

The female researcher has determined the tests related to the two skills of the front handling and the peaceful scoring which are the standardized tests on the Iraq environment as the following:

- 1- Testing the ball handling and its delivery towards the integrated circles on the wall from the distance of 4.50 m (Ali salom, 2004: 175).
- 2- Testing the scoring from the peaceful movement after performing the tapotement (Moaied Ab dAllah and Faez Beshier, 1999: 234-235).

**The pre-tests:**

The pre-tests are conducted for the research study on 23-12-2014.

**The educational approach:**

The female researcher has used the interference in using the exercise methods through the used educational approach for learning the two skills of handling and the peaceful scoring as it is launched from 26/2/2014 till 16/4/2014.

- the educational approach has taken 8 weeks for the handling skill and 4 weeks for the peaceful scoring skill by the rate two educational units weekly thus the total educational units of handling skills will be 8 units and the total educational units for the peaceful scoring skill will be 8 units thus the total of the educational units will be 16 units.

- The educational unit time is 90 minutes according to the distributed exercise methods on the four research groups and an assistant team.

The female researcher used four educational methods which are:

**1- The exercise method (the variable partial serial)**

Which is the interference in the skill or movement segmentation regularly from and to variable places.

**2- The exercise method (the fixing total variable)**

It is the interference in the skill or the movement performance regularly from and to fixing places.

**3- The exercise method (the variable total method)**

It is the interference in the skill or the movement performance regularly from and to variable places.

**4- The exercise method (the fixing partial method)**

It's the interference in the skill or movement fragmentation regularly from and to fixing places.

**The post tests:**

After completing the educational curriculum, the female researcher has conducted the post tests on four research groups and in the same conditions of the pre tests on Sunday 20-4-2014.

Display the results of the pre and post tests for the four searching groups in the two tests of handling and the peaceful scoring, its analysis and discussion:



**Table 4:** shows the values of the mathematical means, the standard deviations, the differences mathematical means, the total of the differences standard deviation of the mean of these differences, the calculated T value, the differences significance of the pre and post tests for the four experimental groups in the handling skill.

No	variables	pre measurement		post measurement		differences mathematical means	total of the differences standard deviation	calculated T value	wrong percentage	differences significance
		-s	A	-s	a					
1	The first experimental group	16.533	2.588	2.374	19.733	3.200	3.745	3.309	0.005	significant
2	The second experimental group	14.933	2.251	18.800	3.256	3.867	3.137	4.774	0.000	significant
3	The third experimental group	14.800	2.624	20.267	1.907	5.466	3.182	6.654	0.000	significant
4	The fourth experimental group	15.200	2.704	20.000	2.104	4.800	3.649	5.095	0.000	Significant

**Table 5:** shows the values of the mathematical means, the standard deviations, the differences mathematical means, the total of the differences standard deviation of the mean of these differences, the calculated T value, the differences significance of the pre and post tests for the four experimental groups in the peaceful scoring skill.

No	variables	pre measurement		post measurement		differences mathematical means	total of the differences standard deviation	calculated T value	wrong percentage	differences significance
		-s	a	-s	a					
1	The first experimental group	4.733	1.163	6.733	0.799	2.000	1.648	4.702	0.000	significant
2	The second experimental group	4.533	0.915	6.533	0.915	2.000	1.464	5.292	0.000	significant
3	The third experimental group	5.067	1.335	6.667	1.113	1.600	2.028	3.055	0.009	significant
4	The fourth experimental group	4.867	1.407	6.667	0.976	1.800	1.821	3.829	0.002	Significant

The results of the both table no 4 and 5 show the significant difference of the four groups in the handling test and the peaceful scoring. The calculated T value should be more than the tabular T value for the sake of the pre-tests with a significance of 0.05 and free degree of 13.

The female researcher attributes this reason for that the exercise methods interference has a positive impact on learning the handling and peaceful scoring skills. As the exercise method (the fixing partial serial) means the sequence in learning the technical performance details one after the other, followed by the correction and the enhancement for the learner currently avoiding the falling in the educational mistakes especially in the first learning stages because the existence of these mistakes and not discovering it will affect negatively on the rest of the technical performance of the skill thus it will effect on one hand the whole detailed technical performance and on the other hand its division into parts and learning each part separately thus integrating, linking and performing these parts as a unit. As we can divide the skill and training it then connecting the parts and exercise on it fully as the most moving skills are learnt by the fragmentation method of the skill into divisions then the image is integrated in performance (Wageh Mahgoub, 2000: 185).

The partial exercise method is very important for the difficult skills lest of occurring obstacles of the learner as a result of its not arrival to the automatic stage for dispersing the skill or the movement and not arriving the neural signals from the brain to the muscles clearly and the overwhelming sending skill is one of the difficult and complex sending which its learning needs using the partial exercise method as the more the skill's complexity and difficulty, the better its learning on stages (Ameen Anwar El-Khouly and Osama Rateb, 1982: 57).

For the exercise method (the variable total method) the change in the learning place in different places of playground is suitable conditions for the variable exercise method which is considered the best method in the subsequent learning stages for what it is achieving in finding the moving programs and laws which the learner utilizes and helping him in performing this skill under conditions of the match as the performance of different places and directions must be done using the distributor

and the collector according to the training systems and different effort circumstances, Doctoral thesis, Baghdad University: the physical education university, 1998: 78) thus the integration and the interference of these methods in a common way will create a state of development as a result of exploiting the positive specifications which describes each method and investing it with a common method which will work on acquiring the performance learning rapidly and properly. Display the results of the pre and post tests for the four searching groups in the two tests of handling and the peaceful scoring, its analysis and discussion:

**Table 4: shows the values of the mathematical means, the standard deviations for the post tests of the four searching groups in the handling ad peaceful scoring skills.**

No	The groups	The pre handling		The peaceful scoring	
		-s	a	-s	a
1	The first experimental group	19.733	2.374	6.733	0.799
2	The second experimental group	18.800	3.256	6.533	0.915
3	The third experimental group	20.267	1.907	6.667	1.113
4	The fourth experimental group	20.000	2.104	6.667	0.976

**Table 7: shows the calculated T value between the four groups in the pre tests for the handling and peaceful scoring skill.**

statistical parameters for the variables	variance sources	deviations	df	variance	calculated F value	significance type
The handling test	between the groups	18.333	3	6.111	1.006	random
	Inside the groups	340.267	56	6.076		
The peaceful scoring	between the groups	0.317	3	0.106	0.115	Random
	Inside the groups	51.333	56	0.917		

Table 7 shows that the calculated F value of the performance tests of handling and peaceful scoring in basket ball is less than the tubular F value of 2.85 at a significance of 0.05 and two free degrees of 3K 56 thus the differences will be random between the four search groups indicating the nonexistence of significant differences between the used methods.

The female researcher attributes the cause of it to that the used training methods has contributed effectively too learn the two skills and it has a positive effect on the two skills, being the different methods specifications make the learner recognize the performance details and its diagnosis during the moving performance rather than increasing the repetitions which is an important requirement which the learner needs in order to convey high level of the motor learning that leads to organize the skill's flow or the movement as the flow is considered a standard of the technical performance integration (the technique) and the level which is reached in the motor learning stages. (Kort Maniel, 1987: 101).

In addition the variance in the exercise practicing whether in the fixing or moving cases increases the different performance formations thus increasing the adaption to the game and control requirements and the final result is accelerating the learning process by investing the time and effort during the learning period.

This is what Mahmoud Dawoud Salman has confirmed in 2005 that the exercise scheduling methods works on organizing and processing the information, the experience by the repeated and distinctive performances of learning which are the evidence of the learner's learning method, his method of receiving information from the surrounding environment honesty and its adoption. So we should choose the most suitable and economical methods in the motor learning because the aim of these methods and its variance is to convey some objectives in the determined exercise period whether for the learning or the training. (Mahmoud Dawoud salman, 2005, 104 ) .

According to the above, it is necessary to integrate these methods into one method which will serve the detailed technical performance on one hand and increasing the accuracy levels of the skill performance on the other hand.

#### 4. CONCLUSION

1. The process of interference between a numbers of the exercise methods has a big and effective influence in getting the learning of the handling and peaceful scoring to basketball.
2. There is a significant difference in affecting the learning of the handling and peaceful scoring skills in basketball between the pre and post tests of the four search groups.
3. There are no significant differences between the used training methods in learning the handling and the peaceful scoring in basketball between the pre tests of the four research groups.

## 5. REFERENCES

1. Amin Anwar El-Khouly and Osama Raten. The motor learning, Cairo: the Arabic Thought house, 1982.
2. Ameer Rasheed Sabea. The skillful learning using the distributor and collector method according to the training systems and different effort conditions, Doctoral Thesis, Baghdad University: the faculty of physical education, 1998.
3. Ali Salom: the tests, the measurement and the statistics in the sporting field, the ministry of high education and scientific research, The University of Qadisiyah, Al-Taief for printing, 2004.
4. Van Daleen. The research methods in education and psychology, translated by Mohamed Nabil and others, Cairo: the Egyptian Anglo library, 1985.
5. Kais Nagy, Bastawesy Ahmed, the tests and the statics principles in the sporting field, Baghdad: The Ministry of Education and scientific research printing house, 1987.
6. Kort Maniel, translated by Abd Ali Naseef. The motor learning, print 2, University of Mosul, the books house administration for printing and publishing, 1987.
7. Mahmoud Dawoud Salman, the modern teaching methods, print 1, Irbid, the modern science house for printing and publishing, 2005.
8. Moaid Abd Allah and Faez Bashier: basket ball, Mosul, the books house for printing and publishing, print 2, 1999.
9. Naheda Abd Zeid Al-Daleemy, the interference of the exercise methods impact on learning the massive sending and beating skills of volleyball, Doctoral Thesis (not published), the physical education college, 2002.
10. Wageh Mahgoub. The learning and the training scheduling, (Baghdad, the ministry of education, 2000).

# THE IMPACT OF THE USE OF COOPERATIVE EDUCATION STYLE IN LEARNING SOME BASIC SKILLS FOR HANDBALL AND ACADEMIC LEARNING TIME

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## Abstract

The problem of the research was about the lack of use appropriate teaching methods in the middle schools to achieve effective learning, which is supposed to invest as much as possible of the academic learning time during the lesson, and about the importance of that stage.

The goals of research, including (set a curriculum in the cooperative learning style, to learn some basic skills of Handball and investment of the academic learning time. the research sample included (Students in middle second grade in Al Abrar School for Boys).

The researchers used the experimental method and the manner of experimental groups to compare between groups. The research sample has been selected in purposive way represented in students in middle second grade in Al Abrar School for the academic year (2013/2014), totaling 85 students divided into three groups, the study concluded that there are moral differences with statistical significance of the research sample individuals in some basic skills of handball and academic learning time, the study found that it's important to use the cooperative learning style in middle school, because of being effective for the age of this stage, because it adds several factors to the students the most important of them are (self-confidence, self-reliance, love of cooperation, configure intimate relationships with each other).

**KEYWORDS:** Cooperative learning. Academic learning time. Handball. Learning.

## 1. INTRODUCTION

The cooperative learning is considered as one of the alternatives for collective classroom dealing, which can be applied for all ages and all levels, there is no doubt that the process of gathering a large number of students and to educate all of them at the same time is saving of efforts and expenses, but this is at the expense of taking into account the individual differences that are ignored despite its presence in the intelligence, inclinations, the willingness, ability to express and social and cultural backgrounds, it is worth that there are a lot of studies that indicate that the students though their different abilities, they become more interested in their education missions if the groups were interacting with each other, and their attitudes towards the school and the system becomes more positive.

Thus the modern methods of learning considered one of the axes and basic pillars in getting a lesson that physical education process. These methods varied remarkably in order to meet the various levels, sex and desires to achieve stimulant and incentive to learn that take the hands of students to the effective learning.

The invested academic learning time in physical education lesson plays influential role in achieving effective learning like the teaching methods as being exploited most of the lesson time and reduce wasted time from it.

**Research Problem:** Developed countries in the field of physical education are interested in educational institutions as it's broad-based of students and school students, who have to be educated and improve their basic skills of the different games, through the programs and curriculum placed in a scientific thoughtful for various stages of education, which is performed during methodical physical education lessons.

The problem of the research was about the lack of use appropriate teaching methods in the middle schools to achieve effective learning, which is supposed to invest as much as possible of the academic learning time during the lesson, and about the importance of that stage.

### Research Aim:

- Set a curriculum in the cooperative learning style, to learn some basic skills of Handball and investment of the academic learning time.
- Recognize the impact of the cooperative learning method in learning some basic skills of handball and investment of the academic learning time.

**Research hypotheses:** There are moral differences with statistical significance between the pro- and post tests using a cooperative learning style for learning some basic skills of handball and the academic learning time.

## 2. MATERIAL AND METHODS

The researchers used the experimental method and the manner of experimental groups to compare between groups

**Research population and sample:** The researcher selected the research sample in purposive way represented in students in middle second grade in Al Abrar School for the academic year (2013/2014), totaling 85 students divided into three groups as follow (A, B, C) to represent research population, the research sample (30 students) in group B selected by draw lots as the experimental group who subject to the cooperative learning style and academic learning time, however the researchers considered group A as the control group, failed students were excluded for the likeness of the sample.

**Tests Used in the research:** Depending on the curriculum followed by the Ministry of Education, which was issued by the General Directorate of Education of Baghdad province for middle school, and after the researchers briefing on the curriculum for this phase, the following tests have been identified:

Adapting and quick throw test in 30 sec. (Diaa Al Khayat and Nofal Al Hayaly, 2001: 492)

Clapotement in straight line test for 15 m. distance (Diaa Al Khayat and Nofal Al Hayaly, 2001: 506)

Swing from stability test (Jamil Kasem Mohamed, Ahmed Khamis Rady, 272-273)

**Pro – tests:** The researchers conducted the pro- tests of search sample for the skills included in the study, over Al Abrar middle school playfield On Sunday, 02/16/2014, and it has been taking into account the test conditions in terms of time and place of the tests implementation, as well as the used tools and how the tests been performed, so that it similar conditions as much as possible to the post tests conditions.

Suggested curriculum in accordance with the cooperative style and academic learning time.

To achieve the scientific research goals, the researcher prepare a curriculum in accordance with the cooperative style and academic learning time to the research sample included 12 educational units (appendix1), by two educational units weekly every module takes (45) minutes for handling, clapotement and swing with hand ball skills, curriculum according to the cooperative style and academic learning time was implemented on the experimental group of the research during the second semester of the academic year (2013-2014) for the period from 16/02/2014 up to 01/04/2014 in Al Abrar middle school playfield for Boys, the module was divided on as follow:

1. Preparation Section: The total time of the preparatory department (10) minutes and includes:

A. The introduction and public warm-up: The students are pulled up in a standardized format and took their absence then give general exercises for whole body's organs, the duration of this part is (5) minutes.

B. Private warm-up: in this part give special exercises for body's parts working in performance and focus on the muscles that has the overload during skills performance process in the module, as well as the use of balls in the performance and the duration of this part (5) minutes.

2. Basic Section: in this part the curriculum is implemented through applying the exercises to learn handling, clapotement and swing skills and its duration is 30 minutes, it's included two parts:

A. learning part: in this part which takes 10 minutes it is focused on the cooperative style through dividing students into groups, the researcher used this method of the cooperative styles it is:

The use of the positive interdependence principle.

It is one of the important elements in the success of the collaborative work between the same group members, as it is important that the educated feel that they need each other, and that one is a complement to the other and in the absence of any member of the group, the work will not be done, which make the group achieve the needed level through butting common goals, the researcher noted that this method made the students never to be absent from the lesson, and give bonuses to a distinct group to be a motive for the rest of the students, as well as through a set of the roles for each member of the group so that each learner realizes that he is indispensable in the group, and without him the required work can't be done, and this is performed by raising the motivation of group members to participate actively during the implementation of the activity.

B. Practical Part: in this part exercises related to the skills in the research are performed by the students, as they are making corrections to errors of skill performance of the teacher as well as the students themselves, according to the distribution of their cooperative roles and to give feedback to the students, the duration of this part (20) minutes.

3. The final Part: is in this section calm and relaxation exercises are given and then some advice and guidance for students and module termination, and the duration of this section (5) minutes.

**Post tests**



The researcher conducted post tests on Tuesday 01.04.2014 in the external playfield of Al Abrar middle school for Boys, after the completion of the implementation of the curriculum with its all modules which was (12) units, and the researcher provided the same conditions with which the pro-tests.

### 3. RESULTS AND DISCUSSION

Showing results of skills pro- and post tests of the research group, analyzed and discussed.

**Table 1: Shows the means, standard deviations, (T) calculated and tabular value, of the pro- and post tests of the research sample:**

Variables	Pro – Tests		Post Tests		Calculated (T)	Tabular (T)	significance
	M	S	M	S			
Adapting and quick throw test (30 sec.)	6.55	2.56	8.00	3.00	3.62	2.09	Moral
Clapotement in straight line test (15 m.)	12.60	2.52	11.25	2.12	3.94		Moral
Swing from stability test	0.75	0.96	3.75	0.96	7.348		Moral

Under statistical significance (0.05) (N-1)

Through what is displayed in Table 1, which shows the means and standard deviations and testing (T.test) for experimental group about the performance level of handling, clapotement, and swing skills in the pre and post tests, and the results showed significant differences for students in the post tests, and the researcher attributed that to that this improvement came as a result of the effectiveness of the cooperative style used through the activation of technical performance and that because of the effectiveness of the cooperation between the research group in the skills in the research, where Salah Aharashi 2001 touched this matter, saying that "cooperative learning helps to raise the level of self-esteem, as it encourages students to change their ideas and opinions as well as feedback from others, it also enhances self-confidence by discussing student affairs with his colleagues, it also enhances and supports peer learning because there is a lot of students who are learning with the help of their peers than they learn from their teachers, and the collaborative work helps student to take responsibility from the moment they were divided into groups through the discussion of roles, also it helps every student to carry responsibility to learn and his colleagues learning in the group "(Salah Aharashi 2007), and (Al Sheikh 1993) pointed that "one of the cooperative learning advantages is the association of achievement and student positive learn with other members of his group he belonged to, on the contrary of the traditional style, which is its principle solitary performance or competitive among students per class "(Samy Saleh El-Sheikh, 1993: 93) and by this the research hypothesis is achieved.

The results of measuring ratios of invested academic learning time, analysis and discussion

**Table 2 measurement of pro- and post ratios of academic learning time for research groups.**

Group	Parts	Pro		Post	
		Crude Degree	Ratio	Crude Degree	Ratio
Control Group	practice of physical activity	43	14.93	46	15.97
	Information receive	58	20.13	60	20.83
	Information evaluation and help	21	7.30	25	8.68
	Waiting	136	47.22	124	43.05
	Moving to take place	23	7.99	25	8.68
	Other	7	2.43	8	2.77
Experimental Group	practice of physical activity	40	13.88	90	31.25
	Information receive	57	19.79	35	12.15
	Information evaluation and help	22	19.79	35	12.15
	Waiting	133	46.18	60	20.83
	Moving to take place	26	9.02	18	6.25
	Other	10	3.47	6	2.08

Through table (2) we note that the percentage of time to practice physical activity in the module of the two groups the control and experimental one of the pro- measurement were respectively (14.93, 13.88), while in the post measurement appeared in a row as well (15.97, 31.25), and through the comparison of the results, we find that there is a development in the proportion of investment of module time in the practice of physical activity for the experimental group at the expenses of the control group, the researcher attributed this result that the determination of the teacher's orders of stating and stop the activity and maintain complete control, system and consistency and to identify the intervals between repeat and another, and other aspects of complete control on the decisions of module behavior by the teacher made the proportion of time spent by students in the waiting period is relatively long, which negatively affects the ratio of exercise physical activity time, and this is what clearly appeared in the proportion of the waiting time, which appeared in the pro- measurement of control and experimental group respectively (47.22, 46.18), while appeared in the post measurement in a row as well (43.05, 20.83), also regarding to the

proportion of time to move to take place and that appeared for the pro measurement respectively (7.99, 9.02), while appeared for the post measurement respectively (8.68, 6.25) and this is consistent with what cited by Adnan Darwish who has stressed that "one of the disadvantages of traditional lessons in physical education is making students stand a long time to wait for their turn in the performance of kinetic duty, which causes some of the deficiencies in the students target " (Adnan Darwish 0.1989: 188) also agreed with Ali al-Dairi and Ahmed Bataineh where he stated that "the error correction period is for some period of boring because it applies activity for all students, not for the student at fault " (Ali al-Dairi and Ahmed blanket, 1987: 99).

On the other hand, we note the improvement of ratios with what mentioned of the competitive style more than cooperative style that the competition is characterized by the continuity in kinetic activity and non-stop except in cases related to this competition law which reduces the proportions of time spent in the waiting and in favor of the practice of physical activity.

As for the percentage of the time of reception of information it has appeared in the control and the experimental group for the pro- measurement were respectively (20.13, 19.79), while appeared in the post measurement (20.83, 12.15) and by comparing the findings of pro- and post measurement, we find that there is no difference showed between the two measurements for the group control, while the percentage appeared higher for the experimental group and the researcher attributed this result to the experimental group student receives information from the teacher on the one hand and from his group to which he belongs on the other hand, the student will be in the midst of competition between himself or with the rest of his teammates, that making him under significant effect of psychological cases related to competition, which makes him cares about these cases more than a receiving information and this is what showed a decrease in the percentage at this time, while it did not show any cited differences at the time ratios to provide helpful information in the control group, and about the lack of a clear difference appearance in the proportion of other things, it's because of that these things are not linked with lesson's manner or style but it's limited to accidents or need a certain something which is not common for all students, but often occurs individually.

#### 4. CONCLUSION

1. The appearance of a significant correlation relationship between cooperative learning and performance of offensive skills in Hand ball.
2. The use of cooperative learning style and academic learning time lead to improve the performance of handling, clapotement, and swing skills level.

#### 5. REFERENCES

1. Dyaa Al Khyat and Nofal Al Hayaly, Hand ball, 2<sup>nd</sup> ed. (AlMosel, Books library for printing and publishing, 2001) p.492.
2. Ayed Abdel Kareem, Introduction in the statistics and SPSS Applications (Al Najaf Al Ashraf, Al Dyaa for printing and design house, 2009) p.157.
3. Salah Al Harashy, Cooperative Learning, (Al Bayan Newspaper, Wednesday 10 Jan 2010)
4. Samy Saleh Al Shaikh, (Comparison between the Cooperative learning strategy and traditional method learning strategy in basic fifth grade achieving in Science. (Published Masters study, Moata University, 1993)
5. Adnan Darwish et al., Physical Education handbook, Dar Altorath Library, AlMadina AlMonawara.
6. Ali Al Diry and Ahmed Batayna, Physical Teaching Methods, Al Amal Printing house, Arbad, Amman, 1987.

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# THE ROLE OF PHYSICAL EDUCATION AND SPORT IN THE DEVELOPMENT OF SOME LIFE PHYSICAL CAPACITIES IN MIDDLE SCHOOL

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## Abstract

The research goal was to know life physical capacities which contains the program of physical education and sport in the middle school? To answer this question, the researcher has supposed that the program of physical education and sport contains some life physical capacities in the middle school has a medium percent because of that it has been done a research on the program of physical education and sport on the four years of middle school education thus it has been used a program of analyzing the content after the statistics and collection of information it has showed the results that the program of the physical education and sport contains some life physical capacities in the four years of the middle school but in a very low percent .

That's why we've stated some facts most of them:

- Make the program of physical education and sport more developed in the light of some life physical capacities.
- Make the program of physical education and sport a list of life physical capacities without forgetting the needs of pupils in the middle school and reality of society and also age's demands.

**KEYWORDS:** The program of physical education, life physical capacities, the middle school period.

## 1. INTRODUCTION

Nowadays, our world is facing what we may call the third wave which is mixture of the great technological progress and the immense communication revolution which has led to a fabulous world changes in all the fields things that made the challenge and the renewal renovation and life skills possession an exigent and urgent requirement to keep up behind civilization this is confirmed by studies and scientific research, "Today, communities are facing challenges and transformations due to both the communication and information revolution add to World Trade Convention. The future of the world has become challenging, it's expected that the sharp of updating will increase and so the transformations will, things which foreshadow of what is called the Future Shock" (Sabri 2004; P: 287), for that Education should keep pace with scientific and technological progress and go ahead to life skills possession needed for the citizens to be scientifically intellect and technologically enlightened; (Mazen, 2002. P: 27).

This imposed on the educational system to activate it's methods and strategies in lines with these changes that have touched the field of education. The Algerian school has known several reforms the main of them the adoption of the Fundamental School in 1976, the restructuring of the secondary school in 1992, and the most recently and new reforms began in 2003 which included the different learning stages.

These reforms were crowned by the transition from learning by goals (aims) to learning by competencies, where the learner is considered as the axe of the educational process not as margin affected recipient. The learner is the cornerstone to fulfill the educational process. Therefore, modern education tend to care about teaching methods since they are among the means on which relies this modern education to get it's goals achieved for that educators gave it a great importance by focusing on the fact that these methods should be related to the individual and social needs. (Soudani, 2011, P: 118).

Zenkalouni confirmed that the methods " is no longer limited to what school does offer as programs but became a curriculum including all what do educational and planned experiences offer in for a general growth" (Zenkalouni, 2007, P: 07), the method included "all the planned experiences which the school provides through the teaching process" (Abdellah. S. , 2004. P: 05). At the present time, the overall growth of the individual can't be achieved unless he acquires the life skills which Mr Ali Ali defined as: "The skills, information, knowledge and values that the individual needs for the daily adaptation to practice them under the changes, the situations and challenges that the society faces". (Ali,2009. P: 27

Knowing that the physical and sports education is one of fertile field for the individual integral and development in the side of effectiveness, knowledge and kinesthetic sense. It has , also, a great contribution in the construction of the young personality by refining his behavior, directing his first motives, formation of his thoughts, refining and developing his physical and cognitive experiences add to his social skills. All this in order to upgrade his abilities and sophisticate his social values in the context of his preparation as a positive interact individual with the present and future data which gives him an opportunity to show his capabilities and satisfy his desires through the planned goals in a form o educational indicators in the process of physical and sport education that is considered as a tool by which the teacher fulfill what the educational system does expect.

Since the life skills are the most important curriculum outcome that qualify the individual adaptation to keep pace with civilization and make him a point of strength for that, we should stop at every stage of the individual growth process and overall knowledge of its characteristics, needs and life skills which may be developed through studies where we highlight by the research on the medium school because it's considered as a sensitive stage and very important turning point in the individual life which reflects what he would be in future by taking in account the characteristics and needs of this period.

For that the researcher judged to study the physical education curriculum role in developing some life skills in the medium school by restricting the life skills included available in the middle school program

**The problematic:** The beginning of the twenty first century saw a great and continuous scientific progress and considering that this progress is measured by the strength of the nations' educational system, these nations had to emphasize on the educational process that lies at the heart of any changes to prepare an individual able to adapt, to evaluate and to bring changes.

In this context, The Algerian ministry of national education reviewed and evaluated the new educational curriculum. That was evident by the beginning of the reform started in 2003/2004 where this reform was very deep in all aspects of the educational system; curriculum, the teaching pedagogical approach, methods and evaluation including formation. The purpose of this reform to let the learner be the center of the learning process where this operation is not limited to provide the learner with some knowledge that interrogate his mind but to provide him with life skills that ensure for him a psychological, social, mental and physical fruitful adaptation which contributes in the physical and sport education learning process by building an integrated, balanced and compatible person which provides him with a sense of sufficiency, confidence and the ability to increase his achievement and effective interaction with the development of everyday life.

The life skills acquiring is the important modern curriculum output at any stage of study process, this is not limited to a specific subject. It's a common responsibility, it touches all specialties. The physical and sport education, in fact, is concerned by the acquisition of life skills which qualifies the teachers to have experience with people, to deal, to work with them, and to take part in the development process by adaptation and keeping abreast of development. (Saaddin, 2010. P: 175).

The studies and scientific researches show that there is a dearth of studies that deal with analysis of the physical and sport education curriculum to know life skills contained in in this curriculum especially at the middle school where the learner's abilities and aptitudes bloom thing that will open to him the area to learn, to acquire and develop his life skills

On this basis the research problematic was born. The researcher worked on the physical and sport education curriculum analysis to know if it contains life skills. For that the following question was asked:

- Does the physical and sports education curriculum contain life skill in the middle school?

**The aim of the study:** To know the life skills contained in the physical and sport education curriculum at the middle school stage

## 2. MATERIAL AND METHODS

The researcher used the analysis content method (physical and sports education curriculum analysis for the middle school stage).

**The research sample:** The research sample consisted in physical and sports education analysis for the four years classes in the middle school.

**Variables of the research:**

**Independent variable:** physical and sports education curriculum for the four years in the middle school.

**Dependent variable:** life skills.

**Steps analysis :**

**Analysis procedures:**

1-Obtaining copies of the physical and sports education curriculum for first, second, third and fourth year of the middle school.

2- The analysis included basic competencies indicators of the curriculum for each year among.

The purpose of the analysis:

1- To identify the life skills included in the physical and sports education program for each year.

2- To know whether the available skills in the physical and sports education curriculum assort with the characteristics of the pupils age of this stage

**Criteria Analysis :** The content analysis criteria were as follow:

[00-20] ----- Very weak

[21-40] ----- Weak

[41-60] ----- Average

[61-80]-----Good

[81-100] ----- Very good

**Data collection tools:**

- References.
  - Previous and similar studies.
- Statistical Analysis:** -Percentage.

### 3. RESULTS AND DISCUSSION

**Table N° 1: shows the frequencies and percentages of life skills included in physical and sports education curriculum for the first year.**

N	Life skills	frequencies		Total	N° of Basic competencies indicators	percentages	Degree
		manifest	Implicit				
01	Social skills	11	09	20	66	30,30	weak
02	Communication skills	03	08	11		16,66	Very weak
03	Belonging skills	00	02	02		3,03	Very weak
04	Self confidence skills	04	09	13		19,69	Very weak
05	Tolerance skills	04	02	06		9,09	Very weak
06	Organiing skills	03	04	07		10,60	Very weak
07	Leadership skills	03	02	05		7,57	Very weak
08	Physical skills and tallent skills	25	06	31		46,96	Average
09	Skills of responsibility	01	00	01		1,51	Very weak
10	Taking the right decisions skills	02	08	10		15,15	Very weak
11	Thinking and exploring	01	02	03		4,54	Very weak
12	Self consideration	00	03	03		4,54	Very weak
13	Psychological presure management skills	03	05	08		12,12	Very weak
14	Security and safty skills	03	02	05		7,57	Very weak
15	Time management skills	02	01	03		4,54	Very weak
16	Self-esteem skills	00	03	03		4,54	Very weak
17	Problem solving skills	02	10	12		18,18	Very weak
18	Critical thought	02	02	04		6,06	Very weak
The average life skills included in physical and sports education curriculum for the first year						12.37	Very weak

Through table 1 which includes 18 life skills, and after analyzing the physical and sports education curriculum for the first year of the middle school, we notice that there were varying degrees between these life skills. “The physical and sports skills” were average with 46.96,

This was the highest value followed by “social skills” estimated as weak percentage with 30.30%. The remaining skills mentioned in the physical and sports education curriculum for the first year were estimated very weak.

**Table N° 2: shows the frequencies and percentages of life skills included in physical and sports education curriculum for the second year.**

N	Life skills	frequencies		Total	N° of Basic competencies indicators	percentages	Degree
		manifest	Implicit				
01	Social skills	03	04	07	35	20	Very weak
02	Communication skills	01	05	06		17.14	Very weak
03	Belonging skills	00	07	07		20	Very weak
04	Self confidence skills	00	01	01		2.85	Very weak
05	Tolerance skills	04	03	07		20	Very weak
06	Organiing skills	03	03	06		17.14	Very weak
07	Leadership skills	02	13	15		42.85	Average
08	Physical skills and tallent skills	00	03	03		8.57	Very weak
09	Skills of responsibility	02	12	14		40	Weak
10	Taking the right decisions skills	01	01	02		5.71	Very weak
11	Thinking and exploring	01	01	02		5.71	Very weak
12	Self consideration	01	04	05		14.58	Very weak
13	Psychological presure management skills	01	02	03		8.57	Very weak



14	Security and safty skills	02	01	03		8.57	Very weak
15	Time management skills	00	03	03		8.57	Very weak
16	Self-esteem skills	02	17	17		48.57	Average
17	Problem solving skills	00	03	03		8.57	Very weak
The average life skills included in physical and sports education curriculum for the first year						16.50	Very weak

Through table 2 which includes 17 life skills, and after analyzing the physical and sports education curriculum for the second year of the middle school, we notice that there were, also, varying degrees between these life skills. The “physical skills”, “skills of talent”, “solving problems skills” estimated at an average degree followed by “taking the right decision skills” with 40% which means a weak percentage. The percentage of the remaining skills included in the curriculum was very weak. Hence, the average life skills included in the physical and sports education curriculum for the second year of middle school was estimated very weak.

**Table N° 3: shows the frequencies and percentages of life skills included in physical and sports education curriculum for the third year.**

N	Life skills	frequencies		Total	N° of Basic competencies indicators	percentages	Degree
		manifest	Implicit				
01	Social skills	08	08	16	59	27.11	Weak
02	Communication skills	01	09	10		16.94	Very weak
03	Belonging skills	03	14	17		28.81	Weak
04	Self confidence skills	00	04	04		6.77	Very weak
05	Tolerance skills	03	01	04		6.77	Very weak
06	Organiing skills	02	01	03		5.08	Very weak
07	Leadership skills	22	11	33		55.93	Average
08	Physical skills and tallent skills	01	01	02		3.38	Very weak
09	Skills of responsibility	03	10	13		22.03	Weak
10	Taking the right decisions skills	00	01	01		1.69	Very weak
11	Thinking and exploring	03	05	08		13.55	Very weak
12	Self consideration	03	01	04		6.77	Very weak
13	Psychological presure management skills	00	01	01		1.69	Very weak
14	Security and safty skills	01	01	02		3.38	Very weak
15	Time management skills	01	05	06		10.16	Very weak
16	Self-esteem skills	19	12	33		55.93	Average
17	Problem solving skills	03	02	05		8.47	Very weak
18	Criticalthinking skills	00	02	02		3.38	Very weak
The average life skills included in physical and sports education curriculum for the first year						15.44	Very weak

Through table 3 which includes 18 life skills, and after analyzing the physical and sports education curriculum for the first year of the middle school, we notice that there were varying degrees between these life skills. The “physical skills and skill of talent”, “solving problems skills” were estimated average followed by “social skills”, “taking the right decision skills” and “self-confidence skills” at a weak percentage. The remaining skills were included in the curriculum with a very weak percentage. Hence, the average life skills included in the physical and sports education curriculum for the second year of middle school was estimated very weak.

**Table N° 4: shows the frequencies and percentages of life skills included in physical and sports education curriculum for the fourth year.**

N	Life skills	frequencies		Total	N° of Basic competencies indicators	percentages	Degree
		manifest	Implicit				
01	Social skills	07	11	18	87	20.68	Weak
02	Communication skills	05	16	21		24.13	Weak
03	Belonging skills	07	06	13		14.94	Very weak
04	Self confidence skills	00	02	02		2.29	Very weak
05	Tolerance skills	10	03	13		14.94	Very weak
06	Organiing skills	05	05	10		6.89	Very weak
07	Leadership skills	24	11	35		40.22	Average

08	Physical skills and tallent skills	00	03	03		3.44	Very weak	
09	Skills of responsibility	05	08	13		14.94	Very weak	
10	Taking the right decisions skills	06	00	06		6.89	Very weak	
11	Thinking and exploring	05	01	06		6.89	Very weak	
12	Self consideration	02	00	02		2.29	Very weak	
13	Psychological presure management skills	01	02	03		3.44	Very weak	
14	Security and safty skills	00	02	02		2.29	Very weak	
15	Time management skills	28	23	51		58.62	Average	
16	Self-esteem skills	02	00	02		2.29	Very weak	
17	Problem solving skills	01	00	01		1.14	Very weak	
The average life skills included in physical and sports education curriculum for the first year						13.31	Very weak	

Through table 4 which includes 17 life skills, and after analyzing the physical and sports education curriculum for the first year of the middle school, we notice that there were varying degrees between these life skills. The “Physical skills and skill of talent”, “solving problems skills” were average, followed by “social skills” and “communicative & intercourse skills” were estimated to a weak percentage. What regards the remaining skills were included in the curriculum at a very weak rate. Consequently, the average of life skills included in the physical and sports education curriculum for the fourth middle school year was estimated to a very weak degree.

#### The research hypothesis discussion:

Research hypothesis: Through tables 1,2,3 and 4, we deduced that the physical and sports education curriculum addressed to the four years pupils of the middle school includes some life skills with average rate and other life skills with a very weak percentage.

The failure of this hypothesis due mainly to the building foundation and design of the physical and sport education curriculum for the four years of the middle school. We noticed, through the previous results, the lack of integration, harmony and continuity of life skills for the four years of the middle school stages. For example, in table 1 the curriculum included 18 life skills with a varying degree but these skills did not continue all of them till the final stage; until the fourth year of middle school education.

It’s, also, noticed that the physical and sports education curriculum did not pay attention to these stages characteristics and to the pupils readiness and needs. For example, through the results, the “skill of feeling responsible” were estimated very weak in the physical and sports education curriculum for all the four years. Knowing that the skill of responsibility, “where the individual feels responsible of his own behavior, he is convinced about what he does, he fumble his role in the social life without hesitation and he does not get the feeling of remorse for his behavior”; (Abdelkader, 1993. P: 46).

Referring to the specificities and characteristics of this stage, Fouad EsSayed (1998) mentioned: “Children alienate from their parents and the parents upset from their children, this is because adolescent, at this critical stage becomes ungainly and does not care about responsibility”. In the same view, Mohammed Aouadh (1999) said: “The adolescent is still a child who should learn gradually to feel responsible of his behavior but unfortunately most of parents do bear the results of their children actions”

For Dr. Oussama Kamel Rateb (2001): “The exaggeration of those who do care about sports upbringing of a teenager, and who do take decision on his behalf as to choose the kind of sport, make him not responsible of his actions”. This is one of the main and delicate points in the personality building of the teenager. For that, persons who do prepare the curriculum, should take in account this point through the arrested objectives and goals to be reached

The results showed, also, that the critical thought skill in the physical and sports education curriculum is included at a very weak rate for all the four years of the middle school education, this is in contrary with the theoretical side where we observe that there are changes at the level of the adolescent mental abilities. “At this age, for the adolescent, the moral concepts start to grow up, and he increases his abilities to inference, to judge, to solve problems and he’ll be capable to analyze, to synthesis and to assemble accurate generalizations”. (Mohammed Titi) This what Alaeddine Kifai (2006) confirmed while saying: “In the adolescence stage, a new mindset appears; critical thought which perfectly reflects a behavior characterized by emotion and mood. Through such a way of thinking, the adolescent want to discover, among what he does face during practicing sport, where the truth and the error exist”. (Kifai,2006. P:345).

For that we should exploit the adolescent mental and intellectual readiness to promote his thoughtfulness value through physical and sport educational curriculum during the middle school education.

Therefore, the middle school stage is considered one of the most fertilize stages in acquiring life skills necessary to keep pace with the newest in life and in the world. This what studies do confirm, “The middle school education is one of the most important stages in the personality formation for the learner and the most important educational ladder stage that it’s

curriculum may contribute in building and nurturing learners who are expected to be leaders. In this stage, the learner will acquire different habits, different behaviors and his capacities, his mental readiness will be developed and so he'll be able to best understand the relationships and how to exercise them." (Messoudi, 2011. P: 120

According to what has been said, it becomes necessary for those who are required to design physical and sports educational curriculum for the middle school education to adopt life skills in the programs and provide them through skills restriction that pupils in this stage should acquire with what follows from needs and readiness without forgetting the active role of the teacher in the activation of these skills through awareness by organizing workshop to determine the importance of life skills in our life, how to develop them and how to grow them among pupils who is the center of the educational process and the reflective mirror for the future.

#### 4. CONCLUSION

In the light of the results statistically treated, we reached the following:

1. The physical and sports education curriculum for the first year of the middle school includes some life skills with a weak degree.
2. 2- The physical and sports education curriculum for the second year of the middle school contains some life skills with a very weak rate.
3. 3- The physical and sports education program for the third year of the middle school contains some life skills with a very weak degree.
4. 4- The physical and sports education curriculum for the fourth year of the middle school includes some life skills with a very weak percentage.
5. Consequently, we deduced that the physical and sports education curriculum for the four years of the middle school stages includes some life skills with a very weak rate.

#### 5. RECOMMENDATION

1. Develop the physical and sport educational curriculum in the light of the life skills.
2. Design physical and sport educational curriculum based on the life skills taking in account the pupils needs and readiness in the middle school education, social realities and the epoch demands.
3. Lead other similar studies to cope other educational stages.

#### 6. REFERENCES

- 1- Ahmed Abdelmu'ti, Du'a Mohammed Mustapha. (2008). Life Skills. Cairo. Dar Al-Sahab for publishing and distributing.
- 2- Hussam Mohammed Mazen. (1, 2002). Proposed model for Including some of Life Skills in the scientific curriculum system in the framework of performance concepts and total quality. The 14<sup>th</sup> scientific symposium. "Learning methods in the light of Performance". The 1<sup>st</sup> volume. Ain Chems University, Cairo. 27.
- 3- Souad Djawdette Ahmed and Ibrahim Abdellah. (2004). The contemporary studying curriculum. Amman. Dar Al-Fikr
- 4- Taha Faradj Abdelkader. (1993). Psychology Encyclopedia and Psychoanalysis. First edition. Cairo.
- 5- Adel Es-Seyed Ali. (2009). Life Skills Methodical Strategy. Alexandria. The New Dar of the University.
- 6- Abdulkarim Abdussamed Sudani and Abbass Fadhil Taleb Sudani. (2011). Biological books Analyzing study for Medium school stage in the light of life skills. Qadisiyah revue in Literature Educational sciences. Volume 10, N° (3-4), (133-117).
- 7- Abdurahmane Mohammed Issawi. (1985). Physiological Psychology (Study in Human Behavior Interpretation). Dar Al-Maarifa of the =University.
- 8- Afaf Othman Othman, Nadia Rashed Daoud, Mustapha Kamel Zankaluni. (2007). Lights on the Sport Educational Curriculum. Alexandria. Dar Al-Wafa of Dounya for Editing and Publishing.
- 9- Aladdin Kafi. (2006). The Adolescent Psychological Growth. Dar Al-Ma'arifa of the University.
- 10- Fuad Ismail Sulayman I'yad and Huda Bessam Mohammed Saaddine. (2010). The Efficiency of Proposal conception for including some Life Skills in Technological Program for the Tenth Fundamental Classes in Palestine. Revue of Al-Aqssa University. (Human Science series). Volume 10, N° 01 PP: 174-218.
- 11- Fuad Al-Behi As-Sayed. (1988). Psychological Foundations for the growth from childhood to old age. Cairo: Dar Al-Fikr Al-Arabi.
- 12- Maher Ismail Mohammed and Mohammed Aboufoutouh Sabri. (2004). The 8<sup>th</sup> Scientific Symposium: "The Absent Dimensions in the sciences curriculum in the Arab World, Egyptian Association, Ain Chess University, Heliopolis, 287.

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## WELLNESS AND FITNESS

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### Abstract

The research was conducted on a sample of 50 adolescents (30 males and 20 females) aged between 16 and 19 years to assess the effectiveness of physical activity in overweight subjects. The study was carried out by administering a questionnaire and through the participation in one extra hour of training per week over a period of six months beyond the scheduled curricular hours of Physical Education in a secondary school in Naples.

**Method** The questionnaire was administered at the beginning to test how interested adolescents are in the problems related to obesity. Participants were offered a program of additional training after their body weight had been measured, and then grouped by similar weight (average weight). The survey was then carried out at the end of extra sessions.

**Results and Conclusion** the results showed that 26 subjects on a sample of 50 reduced their body weight by carrying out a simple additional training session per week. The collection of data confirmed the importance of holding physical activity even if it does not qualify as competitive sports activity.

**KEYWORDS:** Wellness. Obesity. Fitness.

## 1. INTRODUCTION

The protection of health is one of the main objectives of the World Health Organization (WHO, 1998) and of all UN member states. The increasing spread of economic wealth and mechanization are the historical and social causes – now universally recognized – for the syndrome of failure or insufficient exercise called hypokinetic disease. The lack of movement leads to problems of overweight, and obesity in some countries like ours is reaching dangerous levels .

*Globesity*, i.e. global obesity, emphasizes the international dimension given by the World Health Organization (WHO), the current prevalence of body overweight and the consequent low level of physical activity ( Diehl, Choi, 2008). Its identification as an epidemic of the new millennium is confirmed by the World Health Report, which certifies more than a billion overweight people in the world, including 300 million obese ( Adami, 2003). In Italy, the estimation of the obese population stands at around 12% of the total, of which 30% are children overweight or obese. The phenomenon of globesity – a problem of considerable social relevance – is the result of a prolonged energy imbalance in carbohydrate and proteins consumption; it means that children, adolescents, but also adults introduce a surplus of calories compared to what the body actually needs. Statistics on mortality (WHO,2009) and morbidity, show that obesity is a serious risk factor for both cardiovascular and respiratory complications, and diseases that are frequently associated with it, such as diabetes mellitus, hypertension, hyperlipidemia and osteoarthritis . At the international level, numerous studies have indicated some guidelines, such as the Global Strategy on Diet, Physical Activity and Health (WHO, 2002), Global recommendations on physical activity for health (WHO 2010) on Identification, Evaluation and Treatment of Overweight and Obesity in Adults (NIH, 1998). In Europe, where obesity has increased by 10-50 % in the last decade, there have been a few initiatives, such as the Strategy on nutrition, overweight and obesity-related health issues, the White Paper (European Commission, 2010) on a strategy for Europe on nutrition, overweight and obesity, diet , physical activity and health (EU Platform, 2005) and the monitoring of progress to improve nutrition and physical activity and prevent obesity in the European Union ( NOPA, 2008).

In Italy, 30% of adults aged between 18 and 69 years appears to be sedentary (Istat, 2010) so it is recommended to perform physical activity (Rapporto Passi 2011). Adequate information about energy needs, wellness resulting from physical activity, and food hygiene should be pursued since childhood. Educating the child to healthy eating habits and adequate physical activity reduces the risk of obesity in adolescence and adulthood, and tends to induce in the person and in the family, positive changes in eating behavior and more generally of the lifestyle, so that they remain stable and long-lasting.

The observation that the widespread tendency of adolescents to overeating resulted in the idea of the present research. It was carried out at the IPSSCT "G. Fortunato" by the "Parthenope" University of Naples, on a sample of 50 students aged between 16 and 19 for six months. It was developed by administering a questionnaire and offering an out-of-school gymnastics program.

## 2. MATERIAL AND METHODS

### Addressees and Objectives

The study was conducted on a sample of 50 subjects, 30 males and 20 females, aged between 16 and 19 years, with a body weight between 62 kg and 75 kg. The specific objective of this research was to verify the improvement of the reduction in body weight (Leone, 2006) through the application of additional weekly hour of training to be made indoors. The initial and final surveys highlighted the trend of body weight (average) of those involved. All 50 students participated regularly in additional training sessions (Barba, Tafuri 2007).

### Contents additional training

The program of additional training (Barba, Tafuri, 2007), carried out in an indoor facility, includes a ten-minute slow run, eight-minute motion exercises, three-minute breathing exercises, twelve-minute exercises, the use of small tools and small weights, six-minute abdominal and back exercises, ten-minute ball games, three-minute stretching exercises, an eight-minute slow run.

**Material and Equipment**

- Indoor Stadium
- Elastic Fitband
- Wheels Fitness
- Ball normally used in the games (basket and football)
- Medicine ball : 1, 2, 3 kilos
- Questionnaires
- Reporting Grids

**3. RESULTS**

The subjects were divided into nine levels. For each level have been reported, the number of subjects and the average weight corresponding. The first survey showed (table 1 and Graphics 1) a range between 62 kilos and 74.5 kilos. After six months of research the number of subjects with the greatest weight (74.5 Kilos) decreased. The final measurement (table 2 and graphics 2) showed an increase in patients with lower weight at initial recognition and a decrease in the average weight higher (73 Kilos).

**4. CONCLUSIONS**

The issues related to overweight and obesity clearly to be taken into account when devising the necessary strategies for the health protection (Iacovone, Guatelli, 2004), which appears to be the primary objective for the world population. Therefore, health should also be protected through movement (Leo, 2006) and the benefits that physical activity (Ainsworth, Haskell, Leon et al., 2000) leads both to maintain an adequate mental and physical balance. The study conducted on a sample of 50 adolescents showed the effectiveness of physical activity, together with a correct diet, in reducing even significantly the excess weight. In fact, about 26 people, out of a total of 50, reduced their weight in kilograms by participating in the weekly session of additional training in non-school hours.

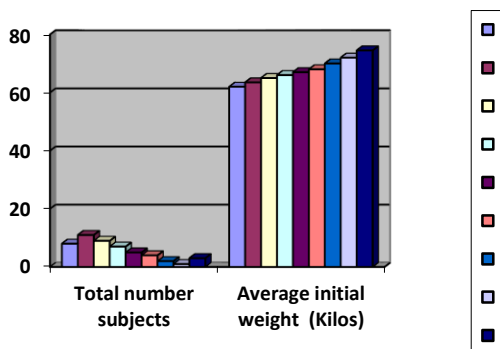
**5. DISCUSSION AND PERSPECTIVES**

A healthier body means feeling good about themselves. The results, as Lavallo and Shepard argued, show that during exercise, the psyche gets double pleasure (Lavallo, Shepard et al., 1980): a euphoric effect for the production of endorphins and an anxiolytic effect because while the body sweats, the mind is freed from everyday worries and tension is reduced. Fragmentation and lack of synergy of interventions, such as the prescription of a diet or generic invitation to conduct a not well identified physical activity, do not meet the suitable requirements for the treatment of obesity. The multidisciplinary approach oriented to the monitoring of the disease and to ongoing support is the appropriate route to pursue in order to get effective results.

**6. TABLES AND GRAPHICS**

**Table 1 – Initial Survey**  
Average weight of 50 subjects

Total number subjects	Average initial weight (Kilos)
8	62
11	63,5
9	65
7	66
5	67
4	68
2	70
1	72
3	74,5

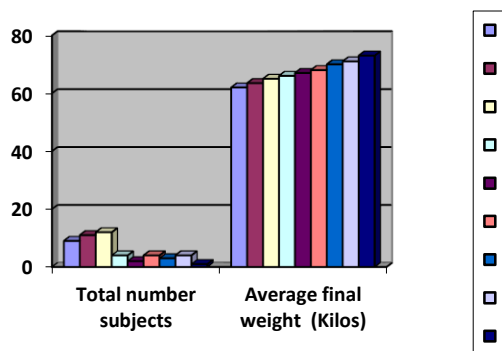


**Graphic 1 – Initial View**  
Average Weight 50 subjects

**Table 2 – Final Survey**  
Average Weight 50 subjects



Total number subjects	Average final weight (Kilos)
9	62
11	63,5
12	65
4	66
2	67
4	68
3	70
4	71
1	73



Graphic 2 – Final View  
Average Weight of 50 subjects

## 7. REFERENCES

1. Ainsworth BE, Haskell WL, Leon AS et al. (2000), Compendium of physical activities: classification of energy cost of human physical activities. *Med Sci Sports Exerc*;25:71-80.
2. Adami G.F. (2003), Guida all'obesità, Franco Angeli, Milano
3. Barba F., Tafuri D. (2007), L'allenamento. Teoria e Metodologia, Idelson-Gnocchi, Napoli
4. NIH - National Institutes of Health (1998), Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults–The Evidence Report. *Obes Res* ;6 Suppl 2:51S–209S.
5. Commissione Europea (2010), Libro Bianco sullo Sport, Direzione Generale dell'Istruzione e della Cultura, Bruxelles
6. Diehl JJ, Choi H.(2008), Exercise: the data on its role in health, mental health, disease prevention, and productivity. *Prim Care. Dec*;35(4):803-16.
7. EU Platform (2005) Diet, Physical Activity and Health, A European Platform for Action
8. Iacovone N. Guatelli G. (2004), Sport, ambiente e salute. Dall'esperienza medica alla pratica sportiva, Società Stampa Sportiva, Roma
9. Lavallè H., Shepard R. J. et al. (1980), Le sport e l'enfant, ed. Euromed, Montpellier
10. Leone L. (2006), La promozione dello sport in ambito internazionale ed europeo, in Rivista telematica [www.giustiziasportiva.it](http://www.giustiziasportiva.it), n. III.
11. NOPA (2008), Il monitoraggio dei progressi per migliorare la nutrizione e l'attività fisica e prevenire l'obesità nell'Unione Europea, Direzione Generale per la Salute e i Consumatori – Commissione Europea (2007WHO02)
12. WHO (1998), Dichiarazione della Sanità Mondiale - La salute per tutti nel 20° secolo, NY
13. WHO (2009), Global health risks: mortality and burden of disease attributable to selected major risks. Geneva, Switzerland:
14. Rapporto Passi 2011

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