

## THE EFFECTIVENESS OF PHYSICAL EXERCISES ON BONE DENSITY AND SOME VARIABLES RELATED TO IT FOR GIRLS OF 18-20 YEAR

Naglaa Ibrahim Gabr, Khadra Eid Mohamed

Suez Canal University, EGYPT

02.03.2010 / 15.04.2010

### Abstract

**Aim:** design a proposed physical exercises program for girls 18 – 20 in order to identify: The Effectiveness of the proposed physical exercises program on bone density and some of it's associated variables include (Calcium - Phosphorus - Estrogen, Parathormone, Calcitonin Hormones- Alkaline phosphatase enzyme), the muscle strength and some physical fitness elements - and to identify the connectivity relationship among them.

**Method:** Experimental methodology with the experimental design with one group.

**sample:** 12 volunteers of the members of intentional Sports Club of Port Said in Port Said (not engaged in sport before).

**Results:** There are significant differences between pre and telemetric to the research group in bone density and some of the variables associated include (calcium - phosphorus - estrogen - hormone Al barratmon - the hormone calcitonin - enzyme alkaline phosphate) in girls than in 18-20 years.

**Conclusion** Physical exercises have a positive effect on bone density and some variables associated with it, such improvement in bone density resulted from the impact of the proposed program to improve certain hormones and enzymes.

**Key words:** Bone density - Exercise - Girls – Osteoporosis.

### Introduction

The exercise are a fertile for human development and prevention of diseases . And regularity in the practice of sport leads to increase the efficiency of the heart muscle, circulatory system, lungs and blood, which is reflected on the health of bones, known as physiological adaptation, physiological changes, multiple, and is particularly associated with respiratory and circulatory system nervous system and the Great consists of bones of a substance protein loaded with metal, and most important of these materials racist calcium and phosphorus, a major mineral in bone formation where the union together to form the so-called nitrate, calcium, given this combination of the extraordinary strength of the bones compared to its weight, making it bear resistance and stress so that they carry the body and if there is that they are more likely to break the so-called disease (osteoporosis, osteoporosis). ( Assessment of bone ,2002),( Jack. K,Vir,. 2003) accordingly the exercise of force and resistance is especially important for girls where they could increase bone mass. If the prevention of osteoporosis must exercise, so as to slow the progression of Disease, and doctors indicate that women who practice And is calcium as a chemical of the most important elements in the body where they combine with the phosphorus component of calcium phosphate, and needs some assistance such as exercise, to be implem-ented within the cells, and supports the metabolism of calcium on some basic elements especially vitamin (D) because of its role on the absorption of calcium especially during physical effort. (Melissa Kaplan,2002) .

The level of calcium intake and phosphorus in the presence of certain hormones, like estrogen, which

maintains the strength of the bone, and hormone barrathormon calcitonin and who organize the contents of the body of calcium, phosphorus, and certain enzymes enzyme alkaline Vosfatyz, which works to regulate the metabolism of calcium in the bones, whole blood, as well as the level of physical activity practice represent the most important variables that affect bone mass and the degree of intensity, as the low level of physical activity practice, as well as the low level of calcium intake, phosphorus, lead to lower bone mass.( Recaltrol News.1996), (Fagienbaum, A.D.,2000). And bone as a web district in need of food it receives the blood vessels are rich in blood and need to exercise, especially strength training and resistance to help in the process of growth is good, although the exercise is not related to the length of bone but an increase in the bid and bone density depositing more salt it, it which increases their strength, practice of sports dealing with osteoporosis and help to increase the strength of bones and tissues by activating blood circulation to the bone, And maintaining bone density through the formation of bone mass and maintain strength and in particular young people.( Pindel ,et al.1997). So it was necessary to prevent osteoporosis in old age Toviralspl for the growth and building bones represent during the early growth comes through increased physical activity in addition to the protection of food containing mineral salts and vitamins, and nutrition and mobility, which means it is a serious problem, a list of adult and youth and children as well, as statistics indicated for patients osteoporosis are women reached 20%, men 5%, and young people 2,5% sports at the age of adolescence is very important since the process Build bones and increase the intensity begins at puberty where at its

peak, Exercise encourages the body to resist pressure on the bones and increase the intensity by 2-8% per year (Witzke, K.A., Sonow, C.M. 2000, (Pediatrics. 2001) Him and the researchers find that there is a close relationship between osteoporosis and adolescence, which is that building Bone proper and correct to be a teenager, If there is interest in the girl at this age in order to build bones healthy and strong, they will not suffer from osteoporosis in old age, nor of osteomalacia in pregnancy, which takes the baby needs calcium, which is also a catalyst for a fragile bones If built after the bone at this stage properly next to us girls and women are problems associated with bone strength and deviations, both in young adulthood or later, because the vast majority of people exposed to this disease are women.

#### The research problem and its importance:

In light of the above it is clear the role of bone in the body composition as well as their vulnerability and growth through strength training and resistance and its importance in the early stages of Sunni where there is a chance to prepare well balanced and lay the foundations of a strong underlying girls in the future, Through theoretical readings in this area, it became clear that osteoporosis or thinning of the bones is not linked to the elderly or postmenopausal female. But a complex disease is linked to several variables represented in the whole systems of life and behavior, **Research Objectives** : The research aims to design a program of physical exercise a proposal for girls 18-20 in order to identify the effectiveness of each of :

1- Bone density and some of the variables associated with it include (calcium - phosphorus - estrogen - the hormone Albarratmon - the hormone calcitonin - alkaline Vosfatyz) 2- Muscle strength and some elements of physical fitness.

3- Correlation between bone density and between each of the (variables associated with it - muscle strength - some components of physical fitness

**Research hypothesis:** 1. There are significant differences between pre and for the telemetric research group in bone density and some of the variables associated with it include (calcium - phosphorus - estrogen - Albarratmon hormone - the hormone calcitonin - alkaline Vosfatyz) for girls from 18-20 years. 2. There are significant differences between pre and post tests to measure the research group in muscle strength and some components of physical fitness for girls from 18-20 years.

3. There is a correlation between bone density and between each of the (variables associated with it - muscle strength - some elements of physical fitness) for girls from 18-20 years.

**Search procedures** • I used a much more extreme experimental method is the same group.

• **The research sample:** sample was chosen in the manner of intentional members of Club in Port Said Port Said sports volunteers, and their number (12) Member Age (18-20) in - did not engage in sports. And unlike the exploratory research sample and their number (4) members. Have been found homogeneity among members of the sample in the variables under discussion.

**Table (1)**  
**Mean, standard deviation and coefficient of torsion of the variables under consideration**

N = 16

NO	Statistical data Variables	The unit of measure	Research Group		
			Mean	Deviation	Sprains
1	Heigh	CM	158.5	4.40	86.0 -
2	Weight	Kg	60.08	4.52	28. -
3	Age	Year	17.43	5.49	86. -
4	Estrogen	Pico gram / mL L	173.85	41.89	22.1 -
5	Albarratmon	Nano g / dL	23.25	4.81	40.1 -
6	Calcitonin	Pico gram / mL L	48.27	5.25	476.0
7	Calcium	Mg / dL	10.78	1.41	91.0 -
8	Phosphorus	Mg / dL	4.89	1.92	38.0 -
9	Alkaline Vosfatyz	IU / liter of blood	47.6	0.521	656.0
10	Bone density of the wrist join	G / cm 2	0.59	0.14	92.0
11	Bone density of the hip joint	G / cm 2	0.62	0.12	.002
12	Bone density of the spine	G / cm 2	0.81	0.09	28.0 -
13	Power of arrest	Kg / lb	26.92	2.07	85. -
14	Strength of back muscles	Kg / lb	55.58	5.55	40.0 -
15	Strong muscles and feet	Kg / lb	54	4.13	73.0 -
16	Vital capacity	Cm 3 / s	1575.5	356.5	61.1
17	Speed(30m)	Again	17.16	3.1	7.0 -
18	Agility	Again	19.17	1.72	29.0
19	Flexibility	CM	7.33	2.16	29.0

Is clear from Table (1) the transactions of the torsion is limited to the  $\pm 3$  which indicates the homogeneity of the sample and experimental research in these exploratory variables

**Data collection instruments: -**

**measurements and tests used: -**

1 - anthropometric measurements (height \_ weight)

2 - **Analysis of blood:** - calcium - phosphorus - not oestrogenic hormone - Albarratmon hormone - the hormone calcitonin - enzyme alkaline Vosfatyz –  
 3-**Bone density measurements:** - detailed wrist hand - hip - the lumbar area of the spine.

4 - **physical tests:** - Force Grip - the power of the back muscles - the power of the two muscles - Vital capacity: Using the device Alaspiromitr. - Speed: Test the enemy in 30m to start higher education.

- Flexibility: Testing the flexibility of the spine by discouraging the bottom of the imam.

- Fitness: Test run winding in 10 m.

**: The proposed design of the sports program: • content of the program:** the program included the proposed number (96) exercise is divided into: (20) exercise flexibility and length, (20) Exercise of the Fund of step, (20) exercise stairs wall, (20) exercise multiple weights (16) weightlifting exercise using devices Resistors (Multi C)

**• components of the program:** the program included the proposed number (36) and a training module for (12) weeks The program began a time of (50 s) divided by (5 s) warm, (40 s) for a period of basic training, (5 s) to calm, and thenInclude the program to increase the period of basic training to become a total time of the unit (80 s) and the basic training period (70 s) at the end of the program.

**Sequencing of the program.**

Table (2)

Sequencing of the program

Stage	The number of units per week	Time Unit	Number of weeks	Number of units of phase
First	3	50 min	3	9
second	3	65 min	4	12
Third	3	80 min	5	15

This program has become in its final form, which included:-(12) Week number (36) modules.

**Results and Discussion:-**

Table (3)

" Wilcoxon " test of significant differences between post and pre indices  
 Measurements of density and some of the variables associated with (n =12)

Variables	Statistical data	Measur-ements	Rank average	Difference		Z	Sig
				n	±		
Estrogen	Post pre	5.7 6.8		3	-	17	N.S.
				9	+		
				-	=		
Albarratmon	Post pre	5.3 6.6		5	-	26.5	N.S.
				6	+		
				1	=		
Calcitonin	Post pre	0 3.5		4	-	0	*
				8	+		
				-	=		
Calcium	Post pre	7 1		11	-	1	*
				1	+		
				-	=		
Phosphorus	Post pre	4 4.1		5	-	30	N.S.
				7	+		
				-	=		
Alkaline Vosfatyz	Post pre	4 6.8		3	-	12	*
				8	+		
				1	=		
Bone density of the wrist joint	Post pre	1.5 5.7		2	-	3	*
				10	+		
				-	=		
Bone density of the hip joint	Post pre	0 6		0	-	0	*
				11	+		
				1	=		
Bone density of the spine	Post pre	0 2.5		0	-	0	*
				4	+		
				8	=		

Indexed value of

Z = 13 at the 0.05 level . Is clear from Table (3) the existence of significant differences at the 0.05 level in favor of the measure dimensional in some variables, which was to measure calcium, calcitonin and the enzyme alkaline Vosfatyz, while no significant differences in measurements of phosphorus, the hormone estrogen, Albarratmon, and there are significant differences for telemetric study group's bone density in the wrist, hip, spine at the level of significance 0.05.

**Table (4)**  
**" Wilcoxon on " test of significant differences between post and pre**  
**indices Measurements of muscle strength and some elements of fitness ( n = 12)**

Statistical data Variables	Measurements	Rank average	Difference		Z	Sig
			N	±		
Power of arrest	Post pre	0.0 6.5	0	-	3	*
			12	+		
			-	=		
Strength of back muscles	Post pre	1 7	0	-	1	*
			11	+		
			1	=		
Strong muscles and feet	Post pre	4 6.8	3	-	12	*
			8	+		
			1	=		
Vital capacity	Post pre	0 3.5	3	-	0	*
			9	+		
			-	=		
Speed(30m)	Post pre	0 3.5	0	-	0	*
			11	+		
			1	=		
Agility	Post pre	0 3.5	0	-	0	*
			12	+		
			-	=		
Flexibility	Post pre	0 3.5	5	-	0	*
			7	+		
			-	=		

Table (4) the existence of significant differences in favor of telemetric in all variables under consideration

**Table (5)**  
**Percentage growth rates of tribal dimensional measurement**  
**Measurements of intensity and some of the variables associated with ( n = 12)**

Variables	Measurement tribal	Telemetric	Growth rates
Estrogen	173.85	200.5	15.33%
Albarratrimon	23.25	24.08	3.57%
Calcitonin	48.27	61.33	27.06%
Calcium	10.78	9.21	14.56%
Phosphorus	4.39	4.85	10.48%
Alkaline Vosfatyz	47.6	58.3	22.48%
Bone density of the wrist join	0.59	0.82	38.98%
Bone density of the hip joint	0.62	0.87	40.32%
Bone density of the spine	0.81	0.86	6.17%

Table (5) that the percentages of the rates of growth measurements tribal dimensional measurements of bone density and some of the variables associated has been confined to between 57.3% and the hormone Albarratrimon, 32.40% were to measure the bone density of the hip.

**Table (6)**  
**Percentage growth rates measurements tribal dimensional measurements**  
**of Muscle strength of some components of physical fitness ( n = 12)**

Variables	Measurement tribal	Telemetric	Growth rates
Power of arrest	26.92	36.38	36.18%
Strength of back muscles	84	102.17	40.32%
Strong muscles and feet	95.85	109	6.17%
Vital capacity	1575.5	1968.2	24.9%
Speed(30m)	17.16	11.42	33.45%
Agility	7.33	12.13	92.77%
Flexibility	19.17	13.16	31.35%

Table (6) the percentage growth rates measurements tribal dimensional measurements of Muscle strength of some components of physical fitness may be limited to

between 17.6% and was to measure the Muscle strength back, 77.92% and was to measure the flexibility of the spine.

**Discussion : \* An investigation of the imposition of the first**, which states that: - There are significant differences between pre and telemetric to the research group in bone density and some of the variables associated include (calcium - phosphorus - estrogen - a hormone Albarratmon - the hormone calcitonin - enzyme alkaline phosphate) in girls than in 18-20 years. Shown in table No. (3) it does not Tugod significant differences at the 0.05 level in the hormone estrogen and Albarratmon and phosphorus, while there are significant differences for each of the calcium salts, the hormone calcitonin, and the enzyme alkaline Vosfatyz which resulted in bone density, both area wrist or region hip or spinal column injuries where the table showed that there are significant differences to them, whereas the Table (5) and private rates of growth that there is a ratio, improved the increase in these variables to measure the dimensional despite not appear statistically significant, we find, for example estrogen, which ratio improves 33, 15%, as well as hormone Albarratmon have not appeared statistically significant, the percentage of improvement was apparent to some extent, reaching 57.3%, and attributed the researchers to the impact of sports activity on the hormonal system, as the results indicate increased phosphorus where the ratio improves 48.10% It is clear from Table (5) that the growth rates for the element calcium was in favor of measurement tribal, reaching 56.14% and attributed much more extreme lack of calcium in the blood to increase the nitrogen in the bones as a result of the activity of sports, which helped to stimulate blood circulation in the bone tissue, leading to the supply of mineral elements for the constructive and the latest increase in the bid and bone density depositing more salt, which has also increased the strength The hormone calcitonin was the growth rate for the telemetric where the percentage of his recovery 06.27%, while the enzyme alkaline Vosfatyz, the ratio improves 48.22% and for measurement dimensional, and this means that the proposed program, which included exercises varied in addition to weight and resistance, which helped on the solidity of the bones due to pressure by increasing the flexibility of the joints and strengthen muscles and increase its size, flexibility, and thereby achieving a balanced growth of the body, as well as taking into account the basic principles of such quality programs as the continuity of performance stable and care to the development of muscle strength, making the exercise performance indicator in the speed of blood flow to various organs of the body, which was a contributing factor in improving the variables calcium metabolism and bone health. It also notes increased hormone Albartramm as the hormone responsible for maintaining the ratio of mineral elements (calcium - phosphorus) in the blood, where accompanied by increased secretion of the hormone Albarratmon increase in the movement of calcium from stores bones where the hormone Albarratmon and calcitonin together a strict mechanism to regulate calcium in the blood, is working

The first release of calcium from bone excreted in the event of excessive and continuous, while the second helps to prevent the start of the bones together to contribute in the process of calcium metabolism and to maintain its percentage in the blood. In the opinion of the Mac et al (2000) that the device is affected by the structural activity in the sports growth and development and adaptation career where performed exercise at an early age to increase bone mass. This result agrees with the study of Albert(2000),Mc Clonahon, et.al (2003) believes that the regularity in the exercise training programs is to improve and revitalize the cells constituting the fabric of Great Britain, resulting in improved chemical processes for some of the hormones controlling enzymes of the Organization of the process of bone metabolism, where they control the process in how much the quantity of mineral salts, such as calcium, phosphorus, essential components of the bones, thus increasing the construction process within the bone.

Indicates Commander (1995) to the importance of physical training with intensity high in nutritional vessels of the bones, due to increased hormone Albarratmon and vitamin (D) to strengthen the blood the required quantity of mineral salts and increasing the activity of cells constructive for bone health. This is consistent with what was noted by Jaffre et al (2001),Honda et al( 2001), and Laing, et. Al (2003) that the practice of the activities of loading and exercise a high collision and training with weights have a positive effect in increasing muscle strength and increasing component of bone and therefore bone density. In the opinion of Fagienbaum (2000), Stephen (2003) that the practice of sport in general and the level of calcium intake prepare a composition factor of bone metabolism and increase the rate of bone mineral density to permit the renewal of better.

As shown in Table (3) the existence of significant differences in favor of telemetric measurements of bone density of the wrist, hip, spine, as well as from Table (5), which indicated that the percentage improvement ranged between (17.6%) of the bone density of the spine (98.38%) the density of the bones of the wrist, while the highest was improved to the bone density of the hip joint was (32.40%), indicating that the proposed training program has helped increase bone density in both the wrist joint, hip, spinal cord, attributable researchers note that the impact of proposed training program, which contains a set of exercises varied and the use of weights, resistors, and systematized scientifically as well as the inclusion program exercises varied by the upper and lower gradient intensity, which lasted (12) a week which led to increase the rate of bone density research sample, which helped the high rate of improvement occurring in the bone density , This finding corresponds with the results of a study Vicente (2003) where indicated to a clear improvement in bone mineral density as a result of attendance in training programs, especially strength training and high-collision, which led to an



improvement in physical and mechanical properties of bone. And returns a much more extreme lack of statistical significant for some variables associated with intensive bone table No. (3) the short period of time for the program and Teriya that if the program continued for a longer period might have been to show statistical significance for the rest of the variables, and the research group do not have age Tdrebey, and so no significant progress to be long period of time with ongoing training. Thus been achieved first hypothesis which states that: - There are significant differences between pre and telemetric to the research group in bone density and some of the variables associated with it include (calcium - phosphorus - estrogen - a hormone Albarratmon - the hormone calcitonin - enzyme alkaline phosphate) in girls from 18-20 years.

**\* In order to achieve the imposition of the second, which states that:** - There are significant differences between the two measures of pre and post research group in muscle strength and some components of physical fitness among girls 18-20 years.

Is clear from Table (4) the existence of significant differences between pre and post tests for telemetric to the research group in muscle strength and some components of physical fitness in question, as well as Azaraljdol (6) rates of growth rates ranged to measure the strength of back muscles by (04,14 %) of the muscles of the men (63.21%), while The highest rate of improvement of the strength of grip, amounting to (8.36%), attributable much more extreme to the effectiveness of the proposed program and its impact is vital for the age level as one of the factors that help to stimulate blood circulation and the acquisition of physical fitness, there must be change for the better in muscle strength and some components of physical fitness, even if to varying degrees And appeared on the statistical significance in all variables of research and power measurements Fist, the power of back muscles, muscle strength the two men, which resulted in some elements of fitness Other physical phenomenon under consideration in the form of vital capacity, speed, flexibility and agility, where rates are improving, respectively, 9.24%, 45.33%, 77.92%, 35.31%, in line with what he referred, Mac Kelve (2002) , where refers to the role played by the nervous system to improve muscle strength and by improving the functional ability of the neural hardware more than the increase in muscle size. And it can be argued that exercise in general is working to improve bone density and some of the variables associated with muscle strength, and some elements of fitness, thereby achieving a second premise which states that: - There are significant differences between the two measures pre and post of the research group in muscle strength and some elements of fitness among girls 18-20 year. The results show tables the former view, and a positive significant correlation coefficient between exercise and bone density (wrist, hip, spine) and some of the variables associated with it of the (calcium - phosphorus - estrogen - Albartramn - calcitonin -

enzyme alkaline Vosfatyz) where the results indicated an increase in all measurements except for calcium where the lower the level of concentration in the blood and returns a much more extreme to the impact of the training program as the calcium has an important role in the process of defibrillation, which lead to the withdrawal of calcium from stores, when an arousal nerve enters the calcium in the end of the connection neuromuscular leading to increase secretion of the hormone acetylcholine, which works to increase the exchange of sodium and potassium within the muscle, causing a defibrillation, and notes through the presentation of the results and there is an inverse relationship between calcium and phosphorus, when low concentration of calcium largest concentration of phosphorus, and the results show a positive correlation between estrogen hormone Albarratmon and calcitonin The enzyme alkaline Vosfatyz and phosphorus while the lower the level of concentration of calcium in the blood, and returns a much more extreme to an increase in calcium deposition in bones, which led to increased density as an increase in bone density means increased phosphorus and estrogen Albarratmon and calcitonin and the enzyme alkaline Vosfatyz in the blood and therefore there is a direct correlation between hormone estrogen and bone density. I explained the tables and there is an inverse relationship between hormone Albartramn, calcium and phosphorus as an increase in hormone Albartramn as the hormone responsible for organizing and maintaining the ratio of calcium in the blood and thereby increase is accompanied by calcium and phosphorus in the bones and increase the nitrogen. The results showed a positive correlation between hormone Albarratmon and calcitonin, where work on the organization of calcium in the blood, is working the first release of calcium from the bones in the case of excreted excessive and continuous, while helping the second to prevent the start of the bones to contribute together to the metabolism of calcium and to maintain its percentage in blood, and there is a direct correlation positive for the enzyme alkaline Vosfatyz with all the variables because of its Doraly increased calcification of bones. returns a much more extreme to the effectiveness of the training program, which included the activities of the weights, resistors, and especially against gravity with exercise flexibility and strength and balance, which led to a significant increment in the intensity of an increase of bone calcium deposition.

A study Thorsen et al (1997) to young females showed signs of biochemical bone collagen to increase as a result of a positive calcium balance by increasing the hormone estrogen and Albarratmon. Thus, The results of research and there is a relation direct correlation between bone density and some related variables and of (calcium, phosphorus, estrogen, Albartramn, calcitonin, and the enzyme alkaline Vosfatyz The result is something natural to the above results, which indicated an increase in some variables, which is an increase in density bone natural result of

the variables increase the metabolism of calcium and thus bone density. This is consistent with a study of San Born (1995) Barbara Brehm (2000) which indicated that good training an effective influence on health in general and on the bones, in particular, and therefore the bone density higher practices of sport activity compared to non-practice and weight training and resistance increase the concentration of salts in the bones, and the size of muscle mass is directly proportional to the content of the bone salts. And through the presentation and discussion of results and a clear correlation between the high positive correlation between bone density, muscle strength showed the tables presented a correlation positive correlation between bone density of the wrist joint, hip, spine and muscle strength. And returns a much more extreme to the involvement of muscle groups of the Party of upper and lower in the proposed program and this confirms that the muscle groups working register link with a higher bone density, and is in line with the results of a study Taffe (2004), which indicated the presence of a link direct relationship between the strength of the chest muscles and mineral density bone arms, and the muscular power of the two men and bone mineral density and body the two men as a whole. also noted the tables previously presented and discussed the existence of a positive relationship represented by a connection between the direction of power between bone density and some components of physical fitness and the findings are consistent with the Study Cooke Kar et al (2000), Vicente, et.al( 2003), Jake (2003) and came to the Jodalaqp positive correlation between the Enaasrallyakp physical .

In the view of researchers note that a review of the results reached them that there is a logical sequence in the search results between the measurements tribal-and-after all this leads to predictable results reached through the presentation of tables of results, which indicated that there is a correlation centrifugal strong bone density and some related variables and between muscle strength and some elements of physical fitness for girls in \*\* The above information indicates the researchers to the importance of exercise, Vamadaomp to exercise in adolescence often leads to obtain bone mass most appropriate for girls and although the intake of calcium required is an important factor to build bone but it alone is not enough and must exercise of 30:20 minutes, three times at least Osbuaialy As for the impact Vtl\_khasaha in:

#### References

- ALBERT, E.G ,SERINAA, J ,CARALAB, O ,.2000,** *The effect of atraining program for 3 years onesponses and progesterone hormones during menstrual cycle phases,* New York,. 87
- ASSESSMENT OF BONE,. 2002,** *Mineral Density and fracture risk, From National Junstitue of 14 eath osteoporosis and related bone diseases*

- 1 - Altmarenat sports working to find a physical pressure on the skeleton of the body.
- 2 - impact on increasing blood flow to the bone, which is loaded with food to the constructive and vitality
- 3 - be a small voltage in the tissues of bone, which works to stimulate bone growth.
- 4 - affects hormones and enzymes that control the body to rebuild bone cells.
- 5 - as well as benefits and Mwtherthaalokry in terms of physical energy and improve blood circulation and mental state and reduce pain and increase functionality and others. Is the most important benefit of exercise for the bones are Moving the body is strong and the weight of walking, running and weight-bearing and resistance exercises.

- And thereby achieving the third hypothesis which states that: there is a correlation between bone density and between each of the (variables associated with it - muscle strength - some components of physical fitness) in girls than in 18-20 year.

#### Conclusions:

- 1 - The positive impact of exercise on bone density and some of the variables associated with them.
- 2 - improvement of bone density as a result of the positive impact of calcium and phosphorus and the hormone estrogen, Albaratmon, calcitonin and the enzyme alkaline Vosfatyz.
- 3 - the proposed program has led to improved levels of muscle strength and development of some components of physical fitness.
- 4 - There is a direct correlation between bone density and some of the variables associated between muscle strength and some elements of physical fitness.

#### Recommendations:

- 1 - Application of the proposed program of exercise clubs and sports programs use weights and resistance training for girls in the early stages of the Sunni and continuing in it.
- 2 - Diversity in training, weight training and resistance to the upper and lower, taking into account the gradient in the intensity and taking into account individual differences and motivation to each girl individually.
- 4 - Develop a standardized training programs for different stages of life commensurate with the other.
- 5 - the need for analysis Tabipokiesat Radiology and physiological tests periodically on girls and women to know the rates of bone density and some hormones to address any deficiencies that may arise on them.
- 6 - attention to the role media to disseminate the importance of sports for girls to keep the bones that

*National resource center.April V(4). (824*

- BARBARA, A. BREHM ,.2002,** *Is strength training good for Kids,* Journal of strength and conditioning research,V(3). **P(57)**
- COMMANDER, F., 1995,** *Physical activities and bone mass in Women, Bull Acad .Natl. Med., (66*

- COOK, K., DIMITRIOV, L., SMITH ET.AL., 2000,** *Regional body composition & muscular strength in female endurance athletes with low and normal radius bone mineral density preliminary findings Euro pen colluge of Sport science 10<sup>th</sup> Annual congress, July 15-16(392)Belgrade-Serbia, P(58)*
- FAGIENBAUM, A.D., 2000,** *Strength training for children and adolescents clinical sports medicine, (4),. P(593-613)*
- HONDA, A., UMEMURA, Y. ASAWA, S., 2001,** *Effect of high impact and low repetition training on bone in ovariectomized rats, School of Health and Sport Science, Tukyoo University, Japan, Sep, 16,.P(93)*
- JACK, K, VIR.,** Bone mineral content of journal comp etitive weight Lifters int sports,. P(171 - 477)
- JAFFRE, C., GAMTAIX, D., DINE-GLAC, G., 2001,** *High impact loading training induces bone bypasses sorption activity young elite female gymnasts .Orleans University , France, Jan., 14,. P(83)*
- LAING, E.M, MASSONI, ET, AL, SPONSE TO., 2002,** *A prospective study of home mass and body composition in female adolescent gymnastics, Journal of Pediatrics, 1(41), p(152)*
- MAC ARDLE, W. KACH, F., KATCH, V., 2000,** *Exercise physiology energy, nutrition and human performance, 4<sup>th</sup> edition, Baltimore, Philadelphia , London,. P(76)*
- MACKELIVE, RJ .et. al., 2002,** *Is there critical period for bone response to weight bearing exercise in children and adolescents, a systematic review, the British Journal of Sports Medicine, V(36),. p(275)*
- MC CLONAHON, BS, et al, 2002,** *Side to side comparisons of bone mineral density in upper and lower limbs of collegiate athletes, Journal of Strength and conditioning Research Lawerce, Kan. Nov. 16(4),. P(211)*
- MELISSA K., 2002,** *Calcium metabolism and metabolic bone disease, osteoporosis, International Journal,. P(456)*
- PEDIATRICALS., 2001,** *Review of factors affecting bone density v, 107,. P(1387)*
- PINDEL, et al, 1997,** *The role of physical exertion in prevention and treatment of osteoporosis,. P(71)*
- SAN BORN, C., 1999,** *Exercise, calcium and bone density, Gatorade, Sports Seile Exchange,. P(141)*
- STEPHEN, H., 2003,** *Osteoporosis Mayo Foundation for Medical Education and Research,. P(87)*
- TAAFFE, DR & MARCVS, R., 2004,** *The muscle strength and bone densit relationship in young women dependence on exercise status, journal of sports medicine and physical Fitness , Mar.(44),. P(103)*
- THORSEN, K., KRISTOFFERSSON, et al., 1997,** *Effect of moderate endurance exercise on calcium, parathyroid hormone and markers of bone metabolism in young women. Calcify Tissue Int ., Jun., P(94)*
- VICENTE, R., JIMENEZ R., et al., 2003,** *Enhanced bone mass and physical Fitness in prepubescent Foot balers, Bone Journal Nov 33(5),. P(853)*
- WITZKE, K.A., SONOW, C.M., 2000,** *Effects of ply metric jump training on bone mass in adolescent girls, Medical science and sports Exercise, V6,. P(1057)*