



## EFFECT OF REGULAR PHYSICAL ACTIVITY ON BONE MINERAL DENSITY OF MIDDLE AGE MEN

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### ABSTRACT

With the human life span getting longer, the importance of recreational and physical activity is apparent. In spite of the apparent increase in physical activity among elderly subjects, there is little hard evidence to support this perception. The age related decline in the various physiological functions is attributed to the sedentary lifestyle. After 35 years the males and females progressively add weight. The total body mass reduces, despite the increase in the body fat. The lean body mass does not usually decrease with age, reason probably is osteoporosis (demineralisation and porosity in the bones), concurrently, the total muscle mass decreases. However, it is quite distinct that regular physical activity keeps the human body livelier, fitter and in better condition for long years before any aging sets in. Osteopenia is a common public health problem that is characterized by low bone mass and increased susceptibility to fractures, primarily in elders aged 50 yr and older. The purpose of present study was to find out the impact of regular physical activity on bone mineral density of middle age men. For this purpose Twenty Five [N=25] men were selected through random sampling from Gwalior (M.P.). The age of selected subjects were ranging 45-52 years. Bone mineral density was tested through DEXA body scan. After 16 weeks of physical training program, the gathered data was analyzed through SPSS and pair 't' test was used and

level of significance was set at 0.05. After analyzing it was found that, 16 weeks regular physical activity program was effective positively on the bone mineral density of middle age men.

**Keywords:** Ageing, Demineralisation and Resistance training

### INTRODUCTION

With the human life span getting longer, the importance of recreational and physical activity is apparent. In spite of the apparent increase in physical activity among elderly subjects, there is little hard evidence to support this perception. The age related decline in the various physiological functions is attributed to the sedentary lifestyle. Aging is the pattern of life changes that occur in all the species as they grow old. In other words, aging is described as a gradual loss of organism's ability to respond to the environment. After 35 years the males and females progressively add weight. The total body mass reduces, despite the increase in the body fat. The lean body mass does not usually decrease with age, reason probably is osteoporosis (demineralisation and porosity in the bones), concurrently, the total muscle mass decreases. However, it is quite distinct that regular physical activity keeps the human body livelier, fitter and in better condition for long years before any aging sets in. Osteopenia is a common public health problem that is



characterized by low bone mass and increased susceptibility to fractures, primarily in elders aged 50 yr and older. Physical activity, specifically resistance exercise, are thought to provide the mechanical stimuli or "loading" important for the maintenance and improvement of bone health, whereas physical inactivity has been implicated in bone loss and its associated health costs. Both aerobic and resistance training exercise can provide weight-bearing stimulus to bone, yet research indicates that resistance training may have a more profound site specific effect than aerobic exercise. Regular fitness and resistance training can improve the mineral density of bones and hence can reduce the risk of fractures with the increase in age.

#### METHODOLOGY

Total Twenty Five [N=25] Male subjects were selected for the study from Gwalior (M.P.) with the help of random sampling. The age of all subjects was ranging from 45-52 years. 16 weeks regular physical activity program (Independent Variable) and Bone mineral density (Dependent Variable) were selected as variables. The data on bone mineral density was collected through DEXA Body Scan with the help of lab experts in diagnostic lab. All the subjects were enquired about their medical history and they were also requested to report any other conditions, which may cause them any kind of problem in exercise. The participants were informed about the objectives and procedures of the study beforehand. One group pre test –post test research design was used for the study. After pre test regular physical activity program was given for 16 weeks (5 days/week and 30 minutes per day) and then followed by post test. The gathered data was analyzed through SPSS and pair't

test was used and level of significance was set at 0.05.

#### RESULTS

The results of the study after analysing the pre and post data of 16 weeks regular physical activity program on bone mineral density of middle age men are shown in the below given tables.

TABLE NO. 1  
MEAN AND STANDARD DEVIATION OF BONE MINERAL DENSITY OF MIDDLE AGE MEN

Test	Mean	S. D.	Std. Error Mean
Pre BMD	0.99824	0.104031	0.020806
Post BMD	1.05728	0.123986	0.024797

Table no.1 shows the values of mean, standard deviation and standard error of the mean for the data on Bone Mineral Density before and after 16 weeks of regular physical activity program are shown. After comparing the mean value between the pre and post test, it was found that training program was effective as the post mean value is greater than the pre mean value. (Verma, 2011)

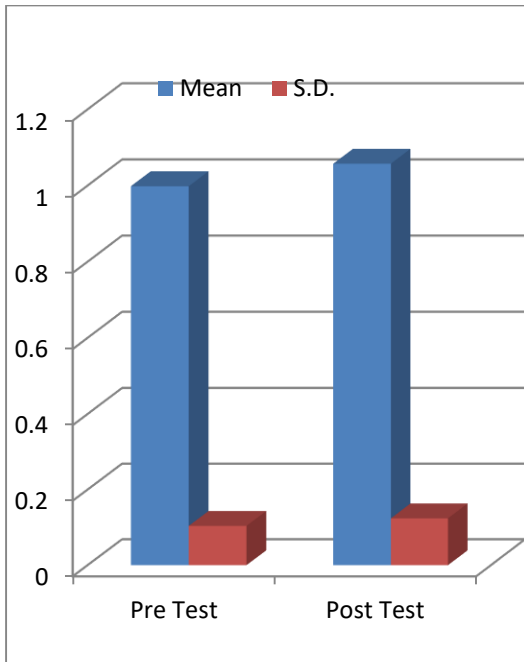


Fig. 1: Mean and Standard Deviation of Pre and Post Test of Bone Mineral Density

TABLE NO. 2  
PAIRED SAMPLE TEST OF PRE & POST DATA OF BONE MINERAL DENSITY OF MIDDLE AGE MEN

Paired Samples Test (Pre and Post Test)							
Paired Differences					t	df	Sig. (2-tailed)
Mean	S.D.	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper			
0.059	0.069	0.013	-.087	-.030	4.244	24	.000

\*Significant at 0.05 level

In Table no. 2, it can be seen that the value of 't' is 4.244. This 't' value is significant as the p-value is 0.00 which is less than 0.05. Thus the null hypothesis of equality of Bone Mineral density in the pre and post test is rejected. It may be concluded that the average Bone Mineral Density of pre and post testing groups are not same. (Verma, 2011).

### Discussion of Findings

After going through the analysis of pre and post training data of Bone Mineral Density of Middle age Men, results were found significant. In order to conclude it can be said that 16 weeks regular physical activity program on middle age men was effective or not, one tail test was used, the value of tabulated 't' at 0.05 level of significance and 24 (N-1=24) d f may be seen from the critical value of 't' is 2.06, since calculated value of 't' (4.244) is greater than tabulated  $t_{0.05} (24) (=1.711)$ , Thus null hypothesis may be rejected and it may be concluded that 16 weeks training programme was effective.

### CONCLUSION

With the growth of age many physiological changes, inactivity and inadequate nutrition leads to gradual loss of bone mass. As bones become more fragile and susceptible to fracture, they are more likely to break after even a minor fall. Number of researches has shown that strength training can play a role in slowing bone loss and in fact it can build bone. So within the limitations of the study it can be said that 16 weeks regular physical activity program was effective on improving bone mineral density of middle age men and similar kind of training programme can be done on other age groups and females also and regular activity and resistance training helps in building bones also along with building muscle mass.



## REFERENCES

- A. Menkes, S. Mazel, R. A. Redmond, K. Koffler, C. R. Libanati, C. M. Gundberg & T. M. Zizic (1993) Strength Training Increases Regional Bone Mineral Density and Bone Remodeling In Middle-aged and Older Men, *Journal of Applied Physiology*, Vol. 74 (5), pp- 2478-2484.
- Bonnie Kandars, David W. Dempster and Robert Lindsay (1988) Interaction of Calcium Nutrition and Physical Activity on Bone Mass in Young Women, *Journal of Bone and Mineral Research*, Vol. 2, Issue 2, pp- 145-149.
- Jamie S. McPhee, David P. French, Dean Jackson, James Nazroo, Neil Pendleton, and Hans Degens (2016) Physical Activity in Older Age: Perspectives for Healthy Ageing and Frailty, *Biogerontology*, Vol.17 (3), pp-567-580.
- Jennifer Layne, Miriam Nelson (1999) The Effects of Progressive Resistance Training on Bone Density: A Review, *Medicine & Science in Sports & Exercise*. 31(1):25-30.
- Jennifer Layne and Miriam Nelson (1999) The Effects of Progressive Resistance Training on Bone Density: A Review. *Med. Sci. Sports Exerc.*, Vol. 31, No. 1, pp. 25-30.
- L. Puggaard, H. P. Pedersen, E. Sandager & H. Klitgaard (1994) Physical Conditioning in Elderly People, *Scandinavian Journal of Medicine & Science in Sports*, Vol.4 (1), pp- 47-56.
- S Lewis, W L Haskell, P D Wood, N Manoogian, J E Bailey & M B Pereira (1976) Effects of Physical Activity on Weight Reduction in Obese Middle-aged Women, *The American Journal of Clinical Nutrition*, Volume 29, Issue 2, pp- 151–156.
- Shigeki Tsuzuku, Taeko Kajioaka, Hidetoshi Endo, Robert D. Abbott, J. David Curb & Katsuhiko Yano (2007) Favorable Effects of Non-instrumental Resistance Training on Fat Distribution and Metabolic Profiles in Healthy Elderly People, *European Journal of Applied Physiology*, 99(5):549-55.
- Tiwari, Sandhya (2009) *Exercise Physiology*, Sports Publication (New Delhi), p-255-260.
- Verma, J.P. (2011) *Statistical Methods for Sports and Physical Education*, New Delhi: Tata Mcgrow Hills.