ABSTRACT

The purpose of study was to examine the differential BMD among athletes with impact and active loading and non athletes. The study also aimed at comparison of BMD among athletes indulged in various sports disciplines and control group. Furthermore, the study intended to assess the causal relationship between muscle performance in terms of high, average and low ability; and BMD of athletes. Physical activities and sport provide several beneficial effects on human body and mind. Various systems in the human body respond differently to varying degrees of physical activities. Adolescent’s indulgence in physical activities have cumulative effects which are obvious during old age. The use of exercise to maintain bone health throughout life and ultimately prevent osteoporosis related fractures has received substantial research attention in recent years because it is a low cost intervention that is available to most of the general public. The study included 30 boys and 40 girls within the age of 15 to 19 years from Thiruvananthapuram district of Kerala state. Purposive random sampling technique was observed to select subjects for impact loading, active loading and non athletic control groups. Impact loading group in girls section included five sportspersons each from kabaddi, taekwondo, middle & long distance running, volleyball and boxing. Impact loading group in boys section included sportspersons from gymnastics, taekwondo and middle & long distance running. Active loading group in girls and boys section included five sportspersons each from cycling and Swimming. The variables selected for the study were BMD at legs, femoral neck, pelvis, spine, arms, dominant hand forearm and total body measured with Dual Energy X-ray Absorptiometry. Muscle performance variables included static strength in terms of dominant hand grip strength, explosive strength in terms of vertical jump, muscular endurance in terms of flexed arm hang (for girls) and pull ups (for boys) and dynamic strength in terms of sit ups in one minute. BMD was assessed in a laboratory, in the presence of investigator, by an expert lab technician and muscle performance was assessed by the investigator with the assistance of a helper in an indoor sports complex. Apart from descriptive statistics, F- ratio was employed for comparison between different loading patterns and sports disciplines indulged apart with control group. For assessing the influence of muscle performance, the athletes were categorized into High, Average and Low performance groups for each aspect. One way ANOVA was used to determine the statistical significance. LSD post hoc test was applied wherever the F-ratio was found to be significant. The level of significance was chosen as .05. It was concluded that; (i) significant difference in BMD of female athletes with different loading patterns and control was evident at legs, pelvis, spinal column, femoral neck and total body, (ii) significant difference in BMD of male athletes with different loading patterns and control was evident at pelvis, spinal column and femoral neck, (iii) female athletes engaged in different sport disciplines possessed significantly different BMD at all the sites and total body, (iv) significant difference among BMD at femoral neck was elicited between female athletes possessing differential dynamic strength capabilities tested in terms of sit ups, and (v) significant difference among BMD at legs was obtained between male athletes possessing differential explosive strength tested in terms of sit ups.