

**ABSTRACT****The Effect of Fortified Milk (Calcium and Vitamin D) and Osteoporosis Gymnastics on Bone Density in Pre Elderly Women (50-59 years) at Work Area of Puskesmas Banyuanyar Sampang**

One of the groups at risk of developing disorders of bone density is pre elderly woman. This is likely due to a number of factors, including the decline in sex hormone (estrogen) levels in woman after menopause, insufficient dietary intake of calcium, and/or inadequate vitamin D. The aim of this study was to analyze the effect of fortified milk (calcium and vitamin D) and osteoporosis gymnastics on bone density in pre elderly women (50-59 years) at work area of Puskesmas Banyuanyar sampang. This study was an quasi experimental, with non equivalent control group design and with double blind. The sampel size for each group was 15 people. So the total sample in this study was 45 people. Study group consisted of three groups of the first group were given a form of gymnastics osteoporosis treatment, second groups were treated osteoporosis gymnastics and milk fortified with calcium and vitamin D, and the control group. The sample was limited by the inclusion criteria. Food consumption with 24-hour recall, food consumption patterns with food frequency questionnaire, serum of calcium concentrations were measured by Photometric Test and bone density was measured by bone ultrasonometer (bone density). The data were analyzed by paired t-test and wilcoxon. The result showed that there was not a significant effect of calcium serum concentration on bone density in first treatment group ( $p = 0,374$ ), in the second treatment group ( $p = 0,066$ ), and in the control group ( $p = 0,799$ ). There was a significant effect of fortified milk (calcium and vitamin D) and osteoporosis gymnastics on bone density ( $p = 0,037$ ). There was no a significant effect of osteoporosis gymnastics on bone density ( $p = 0,157$ ). There was no a significant effect of control group on bone density ( $p = 0,157$ ). The conclusion of this research, fortified milk and osteoporosis gymnastics could be increasing the bone mass density in pre elderly women (50-59 years).

**Keywords:** fortified milk, osteoporosis gymnastics, bone density, pre elderly women