PHYSICAL ACTIVITY AND THE STRENGTH OF BONE IN MENOPAUSE PATIENTS IN NATIONAL SPORTS HOSPITAL IN 2017

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Abstract: Osteoporosis is three times more likely to happen to menopause patients with low physical activity because it causes the bone mass to decrease. Standard examination for osteoporosis is a bone mass examination or also known as BMD (Bone Mass Densitometry). This research aims to identify the correlation between physical activity and bone strength in menopause patients. This is an observational analytical research which used cross-sectional design. The sample consists of 74 patients from Kemenpora National Hospital in 2017. The data were analyzed by using Chi-square test. The result shows that 37% of low physical activity patients have normal bone strength, 63% of which have osteopenia and 20% of the patients have osteoporosis. Meanwhile, 52% of medium physical activity patients have normal bone strength, 19% of the patients have osteopenia, and 33% of the patients have osteoporosis. 16% of patients with high physical activity have normal bone strength, 18% of the patients have osteopenia, and 47% of the patients have osteoporosis. This research proves that there is a correlation between physical activity and bone strength in menopause patients ($p = 0{,}004$).

Keywords: Physical Activity, Bone Mass Densitometry, Menopausal Women

INTRODUCTION

Osteoporosis is one of the degenerative diseases. Osteoporosis can be found worldwide and is still a problem in public health, especially in developing countries. In the United States, osteoporosis affects 20-25 million people, 1 in between 2-3 post-menopausal women.[1]

Currently, Indonesia has a population of 237 million people. It is estimated that by 2050, 28.7% of men and 32.3% of women diagnosed with osteoporosis.[2] Overall proportion of osteoporosis risk in the three provinces was 22.3% and osteopenia was 32.3%. The highest incidence is in North Sulawesi (27.7%), followed by West Java (22.2%) and Yogyakarta (17.1%).[3]

Osteoporosis is three times more common in women than in men. Women have lower peak bone mass and are caused by hormonal changes that occur in menopausal masses.[4] In women caused by the hormone estrogen, the increasing age of fewer estrogen hormone produced, it will more quickly experience the loss of bone mass that over time can cause osteoporosis.[5]

Risk factors for osteoporosis include physical activity. If the less physical activity can cause bone mass density will decrease.[1] Physical Activity Classification consists of heavy physical activity (e.g. lifting heavy items, running fast, etc.), moderate physical activity (e.g. sweeping, mopping, etc.), and in addition to both physical activity included in light exercise.[6] In Indonesia, there are 22 provinces whose inhabitants have light physical activity. The five highest provinces whose inhabitants have light physical activity are DKI Jakarta (44.2%), Papua (38.9%), West Papua (37.8%), Southeast Sulawesi (37.2%) and Aceh (37, 2%).[1] Gold standard according to WHO 2003, to diagnose osteoporosis patients, among others, by examination of BMD (Bone Mass Densitometry)

RESEARCH METHODS

This study uses an observational analytic research design that aims to determine the relationship between variables with hypothesis testing. This research using cross sectional approach, that is data taken and processed at the same time to analyse the existence of independent variable and bound.[7]

The population in this study were all menopausal patients at the National Sports Hospital of Youth and Sports Ministry. The sample in this study was menopausal patients at the National Sports Hospital of Youth and Sports Ministry who meet the criteria of 74 people. The inclusion criteria in this study were menopausal patients with complete medical records and willing to follow the study. The exclusion criteria in this study are menopausal patients with the use of corticosteroids in the long term (more than 2 weeks).

In this research the sampling using nonprobability sampling with total sampling method. The total sampling is the sampling method when all members of the population are used as a sample. This is often done when the population is relatively small, less than 30 people, or research that wants to make generalizations with a very small error.[8]

The data used in this study is primary data in the form of questionnaires and secondary data in the form of medical records that include the results of BMD examination. The questionnaire used in the study is a short questionnaire about daily physical activities according to WHO 2015 which consists of 16 questions. Respondents were 74 people. The researchers recorded the medical record of BMD examination results. After that, the researcher will contact the respondent, meet the respondent, and give informed consent to the menopausal woman about the daily activities. The researcher will ask the respondent to fill out the questionnaire of physical activity.

RESULTS AND DISCUSSION

Respondents were 74 people. The researchers recorded the BMD examination results. After that, the researcher will contact the respondent, meet the respondent, and give informed consent to the menopausal woman about the daily activities. The researcher will ask the respondent to fill out the questionnaire of physical activity.

Table 1. Characteristics Distribution in Orthopaedic Outpatient Room National Sports Hospital of Youth and Sports Ministry in 2017

	Frequency (n)	Presentage(%)
Age		
< 50 years old	11	15%
51 - 60 years old	39	53%
> 60 years old	24	30%
Physical Activity		
Mild	33	45%
Moderate	25	34%
Severe	16	21%
Bone Strength		
Normal	27	37%
Osteopenia	32	43%
Osteoporosis	15	30%

Source: Primary and Secondary Data 2017

A bivariate analysis in this study was conducted using Chi-Square test. The result of bivariate analysis of physical activity with bone strength in menopausal patients was obtained p-value of 0.004 (p <0.005), which means there is a relationship between physical activity with bone strength in menopausal patients. The p-value can be seen in Table 2.

Table 2. Physical Activity Relationship With the Strength of Bone in Patients Menopause In National Sports Hospital of Youth and Sports Ministry in 2017

Physical Activity	Strength of Bone (BMD)						Total		P-Value
	Normal		Osteopenia		Osteoporosis				
	N	%	N	%	N	%	N	%	
Mild	10	37	20	63	3	20	33	45	0,004
Moderate	14	52	6	19	5	33	25	34	
Severe	3	16	6	18	7	47	16	22	
Total	27	100	32	100	15	100	74	100	

Source: Primary and Secondary Data 2017

Based on the results of age study showed that most respondents aged 51-60 years as many as 39 respondents (53%). The age of women entering menopause is 51 years.[9] Most women start experiencing menopausal symptoms at the age of 40s and peak is achieved at the age of 50 years. At the age of menopause there is a decrease in estrogen hormones that cause osteoblasts (bone mass formation) will be inhibited and bone mineral content will be reduced.[10]

Based on the results of physical activity research showed that most respondents have a mild physical activity that is as much as 33 respondents (45%). Lack of physical activity is a risk factor for the occurrence of chronic diseases such as osteoporosis.[11] Opportunities of osteoporosis two times greater in senior women who rarely perform physical activities than those who frequently play physical activities.[12] According to Ganong 2008, someone who is lazy to move or exercise will be hampered osteoblast process.[5]

Based on the results of bone strength research showed that most of the respondents have bone strength measured by bone density level in the value of the examination of Bone Mass Densitometry (BMD) that is osteopenia as much as 32 respondents (43%) using DEXA (Dual-energy X-Ray Absorptiometry).

Based on the results of the study that patients with mild physical activity with the most significant proportion of 63% who had osteopenia, then patients with moderate physical activity with the percentage of 52% normal, and patients with severe physical activity with a proportion of 47% who have osteoporosis. Based on the results of bivariate test analysis with Chi-Square obtained the p-value of 0.004 (p <0.005) indicates that there is a relationship between physical activity with bone strength in patients with menopause.

Lack of physical activity and postmenopausal women cause decreased bone density because in menopausal women there is a decrease in estrogen hormone production resulting in reduced osteoblast activity resulting in reduced bone density.[9] Opportunities for osteoporosis are two times greater in senior women who rarely perform physical activities than those who frequently perform physical activities.[12] Physical activity is less a risk factor for the occurrence of chronic diseases such as osteoporosis.[11] The results of this study are in line with the Kosnayani 2007 study, which states that there is a relationship between physical activity with bone density in postmenopausal women (p = 0.000).

CONCLUSION

This study concludes that this study proved that bone strength is influenced by physical activity and there is a relationship between physical activity with bone strength in the menopausal patients in RSON of Youth and Sports Ministry Orthopedic Pole in 2017 with P-Value on Chi-Square Test found that P-Value of 0.004 (p <0.005)

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