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Obesity Factors on The Incidence of Joint Pain of Elderly



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Abstract

Aging is a process that will be experienced by humans according to the cycle of growth and development. Changes both physically and psychologically often cause disorders and health problems that must be resolved. Problems with the physical aspect of the elderly, one of which is a decrease in musculoskeletal function, especially in the joints, often manifest the appearance of joint pain. The presence of joint cartilage damage due to inflammation, as well as an increase in the load on the joints due to excess body weight (obesity) is other factors that often arise. The hip, lumbal, cervical and knee joints are the parts that support the body's weight, so they experience the most problems. The purpose of this study was to determine the correlation between obesity and the incidence of knee joint pain in the elderly. The design of the study was correlational analytic with a cross sectional approach. The sampling was purposive sampling with 50 respondents as the sample. The instrument used was an observation sheet to measure the respondent's obesity variable and to determine the presence of joint pain using an interview form. The measurement results were then processed and bivariate analysis was carried out using the chi square test. The results of the research analysis showed the value of $p = 0.004$ and $\alpha = 0.05$, this meant that $p < 0.05$, so there was a correlation between the level of obesity and the occurrence of joint pain. This was because not only age but also increasing body weight cause joint pain. The ability of the knee joint to support the body as a whole was getting heavier due to friction of the joint cartilage. From these studies, it can be concluded that in the elderly, excess body weight can affect to the ability of bones and joints and result in joint pain. The health workers should support the elderly so that the elderly avoid the stress.

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INTRODUCTION

Aging is a part of the human life cycle which is characterized by a decrease in physical and psychological conditions. One of the physical conditions experienced is the musculoskeletal system disorders that are often experienced are in the joints with the most common symptom, namely joint pain (Kuniano, 2015). Joint pain is a common complaint in the elderly. According to Stanley (2012), the causative factor includes the process of degeneration due to increasing age, this condition is caused by damage to joint cartilage which results in thinning of joint cartilage so that the bone surfaces grow close together and are prone to friction joints.

Although aging is a typical cause of joint pain, another cause is being overweight or obese. Obesity is a condition characterized by the accumulation of excess fat tissue (Sarafino dkk., 2015). Contributing factors include the consumption of fatty and high-calorie food, lack of activity, changes in mobility and transportation, less activity, an increasing economic level accompanied by changes in lifestyle and eating patterns. Circumstances that occur over a long period of time lead to the accumulation of fat tissue or obesity (Ryan et al., 2016). The degree of obesity is determined based on the Body Mass Index (BMI). BMI is a mathematical formula related to adult body fat, and is expressed as body weight in kilograms divided by the square of height in meters (Janssen et al., 2002). In obese conditions, the burden will be heavier on the hips and knees. This causes the manifestation of joint pain. In addition, the inflammatory effect caused by the accumulation of fatty substances in the joints.

From WHO data in 2016, there were 39% of the world's population who were overweight or around 1.9 billion adults over 18 years. In Indonesia, the prevalence of obesity in the population increased from 2007 to 2018 at 10.5% to 14.8% in 2013 and 21.8% (Risksedas, 2018). The prevalence of central obesity at the national level for the elderly is 18.8% with details in the age group 55-64 years 23.1%, 65-74 years 18.9%, and >75 years 15.8%. The highest prevalence occurs in the 55-64 year age range (Lestari & Bintarti, 2019).

Data in 2018 in East Java province, as many as 16% of the population or as much as 1,163,118 residents were obese. The examination is carried out for a period of one year and it is said to be

obese if the measurement results of the body mass index (BMI) exceed normal (Dinkes Jawa Timur, 2018). Preliminary study conducted in January 2019 found 1,201 elderly people in 2018. While the data obtained from the Poskesdes Ketanon village were elderly with obesity as many as 58 people and 34 people who experience knee joint pain. These data indicate that the incidence of knee joint pain in obese elderly in Ketanon village is quite high.

Obesity mainly occurs in the elderly can cause various health problems, such as hypertension, dyslipidemia, diabetes mellitus and heart disease. The existence of cartilage damage in the joints as a degenerative process and also an increase in body weight causes joint pain manifestations. This affects changes in movement activity in the joints, joint stiffness and can cause paralysis. Of course this will affect to the fulfillment of daily activities (Aspiani, 2014). Other effects that follow according to (Widyanto, 2017) are such as rheumatic diseases and gout and trauma to the bones.

Handling that can be done in the elderly to reduce the risk of joint pain caused by excess body weight is to maintain proportional activity and exercise and maintain a balanced diet according to the body's needs so that this can reduce the load on the joints and knees and maintain bone consistency.

Based on the background above, the researchers wanted to examine whether there is a correlation between obesity and the incidence of knee joint pain in the elderly.

METHOD

The design of the study was a quantitative analytic study with a cross sectional approach. The population was all elderly posyandu members in Ketanon Tulungagung Village who were registered in 2019 using a sample of 50 people with purposive sampling technique. The variables studied were the level of obesity and the incidence of knee joint pain in the elderly. The instrument used are an observation sheet in the form of weight and height measurements to determine BMI and an interview observation sheet.

The study was conducted in January – March 2019 on elderly posyandu members in Ketanon village. After measuring the variables, they were analyzed using the chi square statistical test.

RESULT

1. Univariate analysis

a. Obesity level

Table 1. Distribution of the frequency of obesity levels in respondents in Ketanon Village, Kedungwaru Tulungagung in 2019

Obesity level	Frequency	Percent (%)
Pra Obesity	15	30,0
Mild Obesity	24	48,0
Moderate Obesity	11	22,0
Total	50	100

From Table 1, it can be seen that almost all of the respondents have a mild obesity rate of 48%.

b. Knee joint pain

Table 2. Distribution of the frequency of knee joint pain in Posyandu Elderly Ketanon Kedungwaru Tulungagung village in 2019

Joint Pain incident	Frequency	Percent(%)
Pain	27	54
No pain	23	46
Total	50	100

From Table 2, it was found that some respondents experienced joint pain as many as 27 respondents (54%).

2. Bivariate analysis

Table 3. Analysis of obesity levels with the incidence of joint pain

Obesity level	Joint pain incident				Total	
	No pain		Pain		F	%
	F	%	F	%		
Pra Obesity	12	80	3	20	15	100
Mild Obesity	9	37	15	63	24	100
Moderate Obesity	2	18	9	82	11	100
Total	23	46	27	54	50	100

From Table 3 above, it was obtained from all pre-obese respondents, as many as 80% did not experience joint pain, while those who were mildly obese as many as 82% experienced joint pain.

From the results of statistical analysis using the Chi-Square test using $\alpha = 0.05$, the p value = 0.004 where $p < 0.05$ so H_0 is rejected, which means there is a correlation between obesity and the incidence of knee joint pain in the elderly.

DISCUSSION

1. Obesity rate

From the Table 1, it was found that a total of 50 elderly respondents, almost half of them (24 people or 48%) were mildly obese. According to Misnadiarly (2013), the condition of body weight exceeding normal can be categorized as obesity. According to Mambodiyanto & Susiyadi (2016) increasing age causes changes in the components of

the body in the form of reducing bone and muscle mass, increasing lipid mass and decreasing free lipid, this is accompanied by a disproportionate distribution of lipid that accumulates in the abdomen which causes obesity in the elderly. Increasing age also affects hormonal aspects so that the risk of obesity can also increase if life activities are reduced. The results of this study are in line with research by Mogi dkk., (2014), of 25 respondents, 13 of whom are obese.

Aging makes the function of body systems decrease. The description includes the cardiovascular and vascular systems, digestive, musculoskeletal, respiratory and other systems. Changes in activity that decrease will cause a decrease in muscle mass and the amount of nutrients metabolized into energy. This results in the accumulation of body fat that is disproportionate. Lifestyle and unhealthy eating patterns which are also triggered by financial increases also contribute to the increas-

ing prevalence of obesity in the elderly. Maintaining a pattern of intake of calories and avoiding fatty and sweet foods and doing effective activities are very important to avoid obesity in the elderly.

Based on the discussion above, it can be explained that increasing age, decreasing activity, hormonal and changes in body fat metabolism tend to cause body weight to exceed normal or obesity. This is also driven by changes in eating patterns and unhealthy lifestyles along with the increase in the economy.

2. Occurrence of joint pain

Based on Table 2, it can be seen that from a total of 50 respondents, most of them experienced knee joint pain (27 respondents or 54%). According to Brunner & Suddarth (2015), pain is related to actual or potential tissue damage that is captured as a sensory and emotional response from the body. Pain in the knee can be caused by multiple factors, including genetics, environment, hormones and changes in the reproductive system. Joint pain is also associated with one of the signs and symptoms of osteoarthritis, namely the occurrence of cartilage damage in the joints due to a degenerative process. This is in accordance with the theory from (Sonjaya et al., 2015) that the 56-65 year age group is the most common group suffering from primary knee osteoarthritis. Not only in the knee joint, but also joint pain affect other joints, such as the hip, lumbar and cervical areas. The loss of articular cartilage or joint cartilage will increase with age and the level of activity and body weight increases. This is as a consequence that the joint as a support for the body weight. From this discussion, it can be concluded that joint pain in the elderly can be caused by joint damage due to degenerative processes that cause elasticity and joint movement to be disturbed.

3. Analysis of the correlation between obesity levels and the incidence of joint pain

From the results of the Chi-Square test on the correlation between obesity and the incidence of knee joint pain in the elderly in Ketanon village, Kedungwaru Tulungagung, $p = 0.004$ with 0.05 , where $p < 0.05$ so H_0 is rejected and H_1 is accepted. This means that there is a correlation between obesity and the incidence of knee joint pain in the elderly.

According to Sarafino dkk. (2015) Obesity is a disorder or disease characterized by excessive accumulation of body fat tissue. People who are obese have an increased load on the joints, especially the hip and knee bones. Excessive body weight causes excessive stress on the hips and knees. This causes a high risk of joint pain, especially in the knee area.

Quote from Brunner & Suddarth, (2015), degeneration of organs causes age to be vulnerable to the possibility of experiencing obesity. Especially when you get older, you will be more likely to experience obesity if you don't maintain your diet and regulate activities. When it occurs in those who are elderly, obesity can threaten a person's quality of life. The increase in body weight can also cause an increase in the load on the knee and hip joints and pain manifestations appear. This is also the same as research conducted by Pratiwi (2015), Excess body weight can lead to an increased risk for the onset of Osteoarthritis in the joints with joint pain manifestations.

Based on the results of research conducted by researchers and the theory that supports this research, the researchers agree that the facts and theories are appropriate, that obesity in the elderly can experience joint pain in the knee. This condition occurs because obese people experience an increase in the load on the joints that support weight so that it can cause symptoms, namely joint pain in the knee.

CONCLUSION

There is a correlation between obesity and the incidence of joint pain in the elderly where this is caused not only by the age factor, but also due to excess body weight which causes the knee as a supporting joint to wear out.

SUGGESTION

To reduce joint pain complaints in the elderly is by maintaining proportional activity and exercise and maintaining a balanced diet according to the body's needs so that this can reduce the load on the joints and knees and maintain bone consistency.

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