# *FACTORS ASSOCIATED WITH THE PREVALENCE OF SARCOPENIA IN ELDERLY UNIVERSITY WORKERS*

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***ABSTRACT***

The most common cause of sarcopenia is a lack of physical activity throughout the day. In addition, there are also other possibilities that could be the cause of this loss of muscle mass, namely: Decreased levels of certain hormones related to muscle.

University workers who experience retirement often experience sarcopenia, because when they are still active, university workers are less active and have less protein intake. For this reason, it is necessary to pay attention to the activities of university workers while they are still active and productive at work

**Keywords:** Sarcopenia, *University Workers, Retirement Period*

**ABSTRAK**

Penyebab paling umum dari sarcopenia adalah kurangnya aktivitas fisik sepanjang hari. Selain itu, ada juga kemungkinan lain yang bisa menjadi penyebab hilangnya massa otot ini, yaitu: Penurunan kadar hormon tertentu yang berhubungan dengan otot.

Pekerja universitas yang mengalami pensiun sering mengalami sarcopenia, karena saat masih aktif pekerja universitas kurang aktif dan kurang asupan protein. Untuk itu perlu diperhatikan aktivitas para pekerja perguruan tinggi selama mereka masih aktif dan produktif dalam bekerja

**Kata kunci:** Sarkopenia, Pekerja Universitas, Masa Pensiun

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## INTRODUCING

Sarcopenia is a condition where the loss of muscle mass and strength with age, and this is part of the aging process. In normal human physiology, muscle mass accounts for 60% of body mass, but pathological changes in muscle tissue can have a marked impact on older adults.[1]

Decreased muscle mass does occur in people who are not physically active. They will lose 3-5% muscle mass every 10 years after the age of 30 years old. After passing the age of 30 years, the decline in muscle mass will continue to occur, not only because of the daily lifestyle, but also because of the aging process.[2]

Every loss of muscle mass, accompanied by a decrease in muscle strength and ability to move in the elderly becomes . As a result, this condition can limit the daily activities of the elderly and make the quality of life of the elderly decline. The reason is, muscles have many functions for the body, such as regulating the limb system, providing posture, helping breathing and pumping blood, and helping a person to communicate well. In fact, this condition can happen to anyone over the age of 30. However, about 14% occur at the age of 65-70 years and more than 50% occur at the age of 80 years and over.[3]

For old workers at universities, especially lecturers, they will usually stand for hours while teaching. This results in a lack of movement in the old workers. One of the causes of sarcopenia is the lack of movement in the muscles of the body. This will trigger the occurrence of sarcopenia in university workers.[4]

## CAUSE OF SARCOPENIA

The most common cause of sarcopenia is a lack of physical activity throughout the day. In addition, there are also other possibilities that could be the cause of this loss of muscle mass, namely:

a. Decreased levels of certain hormones related to muscle.

   Hormones play a role in the development of muscle mass and regulation of muscle strength. Testosterone appears to be the central hormone involved in the development of sarcopenia. The hormone testosterone plays a role in increasing muscle mass and activating satellite cells leading to improved muscle function. Growth Hormone And Insulin Growth Factor-1 (IGF-1) influence increasing of sarcopenia. Growth hormone deficiency causes a loss of muscle mass but not muscle strength. In addition to testosterone, insulin deficiency or insulin resistance also causes accelerated development of sarcopenia. [5] Myostatin also another hormone that influence sarcopenia. A deficiency in myostatin leads to an increase in muscle mass Myostatin works through the Activin 2 receptor, activating SMAD2 and SMAD3 which

inhibit muscle satellite cell activation. Myostatin also inhibits AkT, which leads to a decrease in muscle protein synthesis. Antibodies to myostatin have been shown to produce an increase in muscle mass. [6] They can also produce small increases in muscle strength. Various other hormones (such as Estrogen, Dehydroepiandrosterone/DHEA, Ghrelin Thyroid) appear to play a minor role in age-related changes in muscle mass and function.[7,8]

b. Not consuming enough calories and protein each day to maintain muscle mass.

Lack of calorie and nutrient intake, especially protein and amino acids, can also be one of the triggering factors for sarcopenia. These nutrients play an important role in the formation of muscle mass and tissue.

In the elderly and the elderly, there is a decrease in eating patterns due to decreased ability to taste food, difficulty digesting and swallowing food, and the possibility of dental and oral health problems or protein absorption disorders. All of these factors increase the incidence of malnutrition and sarcopenia.[9]

c. Reduced ability of the body to convert protein into energy.

Ada beberapa bukti pengamatan yang menghubungkan asupan protein rendah dengan hilangnya massa otot dan kekuatan di usia yang lebih tua. Suplementasi protein harus memiliki potensi untuk memperlambat hilangnya otot sarcopenia, terutama di antara orang dewasa yang lebih tua dengan asupan kebiasaan rendah. Namun, sementara ada penelitian yang menunjukkan efek positif, bukti manfaat fungsional dari suplemen masih beragam.[10]

d. Lack of the number of nerve cells that send signals from the brain to the muscles to move.

On the neurologic side, loss of muscle strength and muscle strength is associated with age-related changes in motor units and the degree of activation of antagonistic muscles. At the cellular level, aging is associated with decreased motor axon conduction velocity and number of myelinated axons.[11] Decreased reinnervation of motor units after denervation, and with a reduction in the number of motor units and motor neurons specific to type II muscle fibers. Since fast-twitch

motor units are a determinant of the level of force exerted by muscles, their loss in aging contributes to the loss of muscle strength. In fact, under normal aging processes, preferential denervation of type II muscle fibers occurs and these denervated fibers are then re-innervated by the axonal buds of slow motor neurons in a process called motor unit remodeling. However, if denervation exceeds reinnervation, the denervated fiber population will atrophy and degenerate due to loss of trophic factors. This process contributes to the loss of muscle mass at least in part by apoptosis. Thus, denervation appears to be a trigger for muscle loss.[12]

e. Loss of muscle mass can also be affected by body weight.

People who are overweight (obese) are very likely to develop this condition in old age. This loss of muscle mass associated with obesity is known as obesity sarcopenia. Sarcopenia obesity itself is defined as the presence of sarcopenia and obesity conditions in a person. But more specifically, this occurs when a person experiences a decrease in muscle mass and an increase in fat tissue in the body.[13]

Central obesity, especially increased visceral fat associated with increased secretion of proinflammatory cytokines (CRP, IL-6, TNFα, etc.), increased leptin, and inflammation, where the mechanism of low grade inflammation contributes on the incidence and severity of sarcopenia.[14] Increased further inflammation will increase the catabolic process resulting in muscle wasting/atrophy and decreased synthesis muscle protein and further results in a decrease in muscle mass and strength. In addition, the accumulation of visceral fat increase the risk of insulin resistance, where resistance insulin is associated with poor strength and function muscle[15]

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**ACTVITY IN ELDERLY UNIVERSITY WORKER**

Many elderly elderly worker with low activity. It's done due to activity of lecturer need long standing or long sitting, without variety movement, Older adults should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week or do at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week or an equivalent combination of moderate- and vigorous-intensity activity.[16] Physical activity (PA) has been identified as beneficial for many diseases and health disorders, including sarcopenia. Protective role of PA against the development of sarcopenia in later life (odds ratio [OR] = 0.45; 95% confidence interval [CI] 0.37–0.55). A general beneficial effect of PA was found for the prevention of sarcopenia.[17] Physical activity and adequate protein intake can participate in origin. Proteins play an important role in the synthesis muscle mass, muscle metabolism and condition one of which is due to obesity. Use muscle mass index greatly affects prevalence sarcopenia due to the size of the value of muscle mass it depends on the height. Subject with short height will have a muscle mass index better than tall subjects. It's need consideration Body Mass Index as on of cause sarcopenia.[18]

**CONCLUSION**

Sarcopenia is a major problem in the elderly, because it will interfere with the quality of life. One of the causes of sarcopenia is lack of protein intake, obesity and lack of physical activity. In university workers, there is a lack of activity, so that many university workers get sarcopenia at the time of retirement. It is recommended for assistance to prevent sarcopenia in university workers when they are still actively working.

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