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Description of the Knowledge of Elderly People About the Prevention of Osteoporosis at the Age of 60-90 Years in the Lequitura and Aisirimou, Municipality of Aileu Timor-Leste (2025)

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Abstract

Introduction: *By 2050, it is estimated that more than 50% The incidence of bone fractures due to osteoporosis will appear in Asia. With the highest incidence of fractures in elderly people with osteoporosis, the mortality rate is over 20%. The most recent research from the International Osteoporosis Foundation (IOF) revealed that 1 in 4 women in Indonesia aged 50-80 are at risk of developing osteoporosis.*

Research Objective: *To describe the knowledge of elderly people aged 60-90 about osteoporosis prevention in the Lequitura and Aisirimou Aileu-City the Municipality of Aileu Timor-Leste.*

Research Methodology: *The research uses a descriptive quantitative method with a cross-sectional study approach. The techniques used to define the sample are non-probability sampling. The data collection techniques used by the researcher include primary and secondary data.*

Result Discussion : *Shows that the population in the Hamlet of Aissirimou, Aileu City, the Municipality of Aileu is 3389 (100%): in the Village of Hudi-Laran 1498 (44.2%), Village of Aituhu-Laran 630 (18.6%), Village of Berate 451 (13.3%), Village of Erratum 451 (13.3%), Village of Erratum 24 (7.2%) and in the Village of Besilau 565 (16.7%) and population of the Hamlet of Lequitura 947 (100%): in the Village of Lequitura 206 (21.8%), in the Village of Rai-Rema 378 (39.9%), in the Village of Riheu 184 (149) and Village of Erluli 179 (179%). (18.9).*

Conclusion: *Based on the research results presented in the frequency distribution, the elderly people from Hamlet Lequitura and Aissirimou, for the most part, apply the Level of Knowledge in the prevention of osteoporosis with a good category in 47.2%, an adequate category in 41.7% and a low category in 11.1% of the study (Tilman CB. et al, 2025).*

Keywords: Knowledge, Prevention, Osteoporosis at Age 60-90 Years.

Introduction

According to the World Health Organization (WHO, 2021), one in three women and one in five men over the age of 50 suffers from osteoporosis, meaning there are 200 million people with osteoporosis worldwide. By 2050, it is estimated that more than 50% incidence of bone fractures due to osteoporosis will appear in Asia. (Regina, et al, 2019) Padjajaran University Faculty of Medicine. Osteoporosis can be prevented early or at least delayed its occurrence by cultivating healthy lifestyle consume nutritious foods, balanced diet that meets nutritional needs with elements rich in fiber, low in fat and rich in calcium (1000-1200 mg/day), exercise regularly, do not smoke, and do not consume alcohol because of cigarettes and alcohol, can double the risk of osteoporosis. The risk of osteoporosis can cause bone fractures that can lead to death from spinal fractures, but lack of knowledge about osteoporosis and early prevention tends to increase the number of osteoporosis incidents (MS, 2018; cited by Tilman CB., et al, 2024).

Osteoporosis has become one of the most common causes of suffering and disability in the elderly. If not managed properly, it can cause fractures. If not managed properly, it can result in broken bones, disability, and even complications that can lead to death. Furthermore, the medical expenses that must be incurred are certainly very high, consuming endless time and suffering (Thandra, 2022). Osteoporosis can be found and spread throughout the world and remains a public health problem, especially in developing countries. In the United States, osteoporosis affects more than 20–25 million people, 1 in 3 postmenopausal women, and more than 50% of the population over the age of 75–80. Approximately 80% of people with osteoporosis are women, including young women who experience cessation of their menstrual cycle (amenorrhea).

According to the Department of Health of the Republic of Indonesia (2013), the impact of osteoporosis in Indonesia is already at a level worth noting, affecting 19.7% of the population. Osteoporosis is affected by several factors, and in individuals, it is multifactorial, such as unhealthy lifestyles, inactivity, or lack of exercise. Less impacted by osteoporosis are lack of daily physical activity and insufficient calcium intake, which leads to low bone density until osteoporosis occurs (Thandra, 2022). According to the resident and international demographic data report issued by Bureau of The Census USA (1993), it was reported that Indonesia in 1990-2025 will have an increase in the number of elderly people by 4.14% cited by (Tilman CB., et al, 2025).

The largest number in the world compared to the increase in the number of elderly people in other countries such as Kenya is 3.47%, Brazil 2.55%, India 2.42%, China 2.20%, Japan 1.29%, Germany 66%, Sweden 33%, data from Romania (2021), in Indonesia, there was a significant increase in the elderly population. It recorded 7.18 % (14.4 million people) in 2020. (Sunray, et al 2016). Based on data from the statistical center, in the year 2017 it has 8.97% or about 23.4 million of the elderly in Indonesia in 2018 it has 9.27% or about 24.49 million of the elderly of the entire population of Indonesia (Elderly Statistics Center, 2022). The amount of osteoporosis in Indonesia is much higher than the latest regulations from the Ministry of Health,

which sets the numbers 19.7 % of all the population. Records in several cities equal with Jakarta, Semarang, and Medan even reached 30 % (Thandra, 2021). According to provincial data North Sumatra in 2019 number additional percentage age in 2016 was 6.69% in 2017 to 7.25% in 2018 the percentage of elderly is 7.28% or about 3.26 million elderlies.

The number of people suffering from osteoporosis is 200 million worldwide while all people have the same cases according to (Thandra, 2022). Factors about osteoporosis: One in three women over 50 suffers from osteoporosis and one in five men over 50 suffers from osteoporosis. Low or below-normal bone mass has recorded up to 200 million people with osteoporosis in Europe, Japan, and America, up to 75 million, while in China it reaches 184 million. People with osteoporosis are at risk of dying from hip fractures. Hip fractures carry the same risk of death as breast cancer (Silveira, 2021). Meanwhile, according to data from the Indonesian Osteoporosis Association (PEROSI) in 2021, approximately 41.8% of men and 90% of women in Indonesia have symptoms of osteoporosis, while 28.8% of men and 32.2% of women have osteoporosis.

While the highest incidence of hip fractures was in men aged 90-94 years, with 718 cases, the lowest was in those aged 40-44 years, with 10 cases, according to the Indonesian Ministry of Health (2015). Causes include low estrogen in women, low physical activity, lack of sunlight exposure, lack of vitamin D, advanced age, and low calcium intake. This is evidenced by the low calcium intake of Indonesians, which averages 245 mg per day, only a quarter of the international standard (1,000-1,200 mg per day for adults). (Yunani, 2020). The International Osteoporosis Foundation (IOF) noted that every woman has a 40% risk of fracture due to osteoporosis in her lifetime, and men have a 13% risk. The United States of America observes that one in two women and one in eight men over the age of 50 a10 will suffer a fracture due to osteoporosis.

In the elderly, it reaches more than 1.2 million each year. Meanwhile, in England, approximately 150,000–200,000 elderly people suffer fractures caused by osteoporosis. Among the elderly, 20% will suffer a fracture and die each year. By 2020, it is estimated that 50% of the population over 50 in the United States will be at risk of fractures due to osteoporosis. By 2050, it is estimated that there will be 6.3 million fractures annually worldwide, with more than 50% occurring in Asia. With the highest incidence of fractures in elderly people with osteoporosis, the mortality rate is over 20%. The most recent research from the International Osteoporosis Foundation (IOF) revealed that 1 in 4 women in Indonesia aged 50–80 is at risk of developing osteoporosis. Furthermore, the risk of osteoporosis in Indonesian women is four times higher than that of men. This bone-loss disease typically affects most postmenopausal women (Dates, 2017). Less osteoporosis due to lack of daily physical activity and lack of calcium intake, bone density becomes low until osteoporosis occurs (MS RI, 2022). Decreased capacity of various organs, functions and the body's system is usually a sign of the process. This aging can occur at age 40 and will cause problems around age 60 (Thither, 2021). Aging is a condition that occurs throughout human life. The aging process is a lifelong process, not just from a certain point in time, but from the beginning. of human life.

Research Objective: To know the description of the knowledge of the elderly about the prevention of osteoporosis aged 60-90 years, in Hamlet Lequitura and Aisirimou, Aileu-City Administrative Post, in the Municipality of Aileu Timor-Leste.

Theoretical Framework

Knowledge or cognitive is a very important domain for the formation of your actions (Over Behavior). From experience and research, it turns out that behavior based on knowledge will be more than behavior that is not based on knowledge. Adequate knowledge in the cognitive domain has 6 levels, namely:

1. Know form thought of material that has already been taught, the knowledge is profound.
2. Comprehension uunderstanding and meaning with an ability to correctly explain about objects that are known and where to remember and where to interpret correctly.
3. Application is defined as the ability to use the material that has been studied in the mil/ (reality) situation or condition.
4. Analysis is a way of expressing a material or an object into components—components, but still related in the others.
5. Synthesis in question refers to an ability to realize or connect parts into a new whole.
6. Evaluation refers to the ability to justify or evaluate a material or object, the evaluation is based on a self-criterion determined or using existing criteria.

Osteoporosis is a disease condition characterized by low mass and macrostructural deterioration of bone tissue, causing Bone fragility, thus increasing the risk of fracture. Osteoporosis is a disease in which there is a decrease in total bone mass. There is a change in normal homeostatic bone remodeling; the rate of bone resorption exceeds the rate of bone formation, resulting in a decrease in total bone mass. Bones become progressively porous, brittle, and prone to fracture. Bones fracture easily under stresses that normal bone would not experience. Osteoporosis commonly results in fractures of the thoracic and lumbar spine, fractures of the femoral neck and trochanter region, and wrist fractures. Double compression fractures of the vertebrae result in skeletal conformities. (Ode, La Shariff, 2021).

Osteoporosis is a decrease in bone mass caused by an imbalance in bone resorption or a decrease and formation of bone. In osteoporosis, there is an increase in bone resorption or a decrease in bone formation. Furthermore, osteoporosis is a metabolic bone disease characterized by a reduction in bone density, making fractures more likely. (Asking, M, 2021). According to (Senarath, 2020), there are two types of osteoporosis: primary and secondary. There are two types of primary osteoporosis: type I (postmenopausal) and type II (still). In addition to these categories, there are other categories (juvenile idiopathic osteoporosis), osteoporosis whose cause is unknown. Primary osteoporosis can occur in all age groups. Triggers of this type of osteoporosis include smoking, physical activity, delayed puberty, low body weight, alcohol, white/ Asian race, family history, body posture, and low calcium intake.

Type I (postmenopausal)

This occurs 15 to 20 years after menopause. This is characterized by crush fractures of the spine, spoon fractures, and reduced dentition. This is caused by the extensor trabecular tissue in this location, where the trabecular tissue is most responsive to estrogen production. Therefore, it can be said that

osteoporosis occurs due to a lack of estrogen (the main female hormone) , which helps regulate the transport of calcium to a woman's bones. Symptoms generally appear in women between the ages of 51 and 75. but they can start earlier or later. Not all women are at the same risk of suffering from this disease as Black women.

Type II (caracul l)

It occurs in men and women aged 70 years. Characterized by pelvic and bone fractures Rear wedge type. The greatest loss of cortical bone mass occurs with age. It is caused by age-related calcium deficiency and an imbalance between the rate of bone destruction and new bone formation. This disease usually occurs in people over 70 and is twice as common in women.

Idiopathic juvenile osteoporosis

The cause of this type of osteoporosis is unknown. It occurs in children and young adults who have normal hormone levels and functions, normal vitamin levels, and no obvious cause of bone fragility. (Santa, Septal, 2020).

Osteoporosis is a silent disease. Those with osteoporosis usually have no complaints until they suffer a fracture. Osteoporosis affects bones throughout the body, but most of them are under pressure (vertebral bones and the femoral spine). The vertebral bodies exhibit deformation, shortening, and compression fractures. This causes the patient to become shorter and develop an abnormal vertebral curve (chiposis). Osteoporosis of the femoral spine often predisposes to pathological fractures (i.e., fractures resulting from minor trauma), which occur frequently in elderly patients. The total mass of the affected bone decreases and shows thinning of the cortex and trabeculae. In mild cases, diagnosis is difficult due to variations in trabecular thickness in different "normal" individuals. Diagnosis can be made radiologically or histologically if osteoporosis is severe. Bone structure, determined by chemical analysis of bone ash, showed no abnormalities. Patients with osteoporosis have normal serum calcium, phosphate, and alkaline phosphate levels. Osteoporosis occurs due to chronic interactions between genetic and environmental factors.

Osteoporosis is often called the " silent disease " because it causes no obvious symptoms until a bone fracture occurs for the first time. Most people with osteoporosis only discover they have the disease when X-rays show broken bones. Symptoms in old age vary; some have no symptoms, while others often experience classic symptoms such as back pain, which is often triggered by physical stress and often resolves on its own after 4–6 weeks. Other patients may present with symptoms of fractures, loss of height, and curvature, which is a deformity due to collapse and fracture of the mid-thoracic spine. Fractures involving the femoral neck and collarbone occur frequently in approximately 305 women with femoral neck fractures who suffer from osteoporosis. Compared to only 15% of men, fractures occur not only due to osteoporosis but also due to the tendency of older adults to fall (Syam, D, & Sunaryo, H, 2014).

Research Methodology

Used method Quantitative Descriptive to process data in the form of numbers, as a result of measurement used to find out “Description of the knowledge of elderly people about the prevention of osteoporosis at the age of 60-90 years. The techniques used and Purposeful sampling which is

known as representative sampling, since the sampling technique used in this research is to select representatives based on some objectives that the researcher wants to achieve good results (Tilman CB., et al, 2025).

The data collection techniques used by the researchers are primary data and secondary data. Primary data is data collected directly from all elderly people. from age 60-90 years in the village of Lequitura and Aisirimou, Aileu-City Administrative Post. The secondary data consisted of data and information obtained by the researchers through direct observation at the research sites and data obtained by health professionals. Univariate analysis is the analysis of the variable based on the research results (Notoadmojo, 2020; Tilman CB. et al., 2025). Universe analyses synthesize the data collected from the measurements performed, thus providing valuable information. The following data will be analyzed by observing the percentage of data collected in the free distribution table below. We will look for the percentage of each response in the interviews and then discuss it.

Result

Table 1. Population Frequency Distribution by Village in 2025.

Assent			**Reading**		
Village	**F**	**%**	**Village**	**F**	**%**
Hudi-Laran	1498	44.2	Reading	206	21.8
Aituhu Laran	630	18.6	Rai-Rema	378	39.9
Berkati	451	13.3	Riheun	184	19.4
Erquatum	245	7.2	Erluli	179	18.9
Besilau	565	16.7			
Total	3389	100	**Total**	947	100

Table 2. Population frequency distribution by sex.

Sex	**Aissirimou**		**Reading**	
	F	%	F	%
Masculine	1666	49.2	477	50.4
Feminine	1723	50.8	470	49.6
Total	3389	100	947	100

Table 3. Frequency distribution of respondents by sex

Sex	Frequency (n)	%
M	18	50
F	18	50
Total	36	100

Table 4. Frequency distribution of respondents by age.

Age	Frequency (n)	%
60-69	28	77.8
70-79	5	13.9
80-90	3	8.3
Total	36	100

Table 5. Frequency Distribution of respondents based on their level of knowledge.

Knowledge	Frequency (n)	%
Good	20	55.1
Adequate	15	41.7
Less	1	2.8
Total	36	100

Table 6 Frequency distribution of respondents based on knowledge.

To know	Frequency (n)	%
Good	20	55.1
Adequate	15	41.7
Less	1	2.8
Total	36	100

Table 7. Frequency distribution of respondents based on understanding.

Understanding.	Frequency (n)	%
Good	17	47.2
Adequate	17	47.2
Less	2	5.6
Total	36	100

Table 8. Frequency distribution of respondents based on application.

Application	Frequency (n)	%
Good	17	47.2
Adequate	15	41.7
Less	4	11.1
Total	36	100

Discussion

The discussion of this research will explain or present the single variable, or variables, which is the knowledge of older adults about osteoporosis prevention between the ages of 60 and 90, with the sub-evaluable variables "knowledge, understanding, and application." According to the results obtained by the researcher in this research, they are as follows:

Knowledge Level

Based on the results of this research, it is discussed about the description of the knowledge of the elderly about the prevention of osteoporosis at the age of 60-90 years in Lequitura and Aissirimou, Administrative Post of Aileu City, Municipality of Aileu, in 2025. Analysis of the results of the general level of knowledge, this research showed that 36 respondents in Lequitura and Aissirimou, Administrative Post of Aileu City, the Municipality of Aileu, the majority had 20 people (55.6%) good levels of knowledge, and the minority had 1 (2.8%) low levels of knowledge. From this result it is shown that the level of knowledge of the elderly respondents about the prevention of osteoporosis at the age of 60-90 years is good because the elderly completed secondary education in the majority in 16 (44.4%) and completed university in 2 (5.6%).

The frequency distribution showed that 36 elderly respondents Twenty (55.6%) people had a majority level of knowledge with a good category, and one (2.8%) had a minority level of knowledge with a low category. This result shows that the level of knowledge of elderly people aged between 60 and 90 years about osteoporosis prevention is good, as most of them completed high school (16 people) (44.4%) and two (5.6%) completed university. According to scholar Notoatmodjo (2018), knowledge is an important guide to shape each person's action or practice.

The frequency distribution shows that of the 36 elderly people The majority had a good level of knowledge (17 people) and adequate knowledge (17 people) (47.2%), while a minority had a low level of knowledge (2 people) (5.6%). This result shows that the level of knowledge of older adults about osteoporosis prevention at the age of 60-90 is good, as most older adults completed high school (16 people) (44.4%) and completed higher education (2 people) (5.6%). According to academic Susanto (2013), cited by Dasani (2019), understanding means having the ability to explain correctly and clearly about objects that we already know and can clearly interpret. According to Susanto (2013), cited by (Dasani 2019; Tilman CB., et al, 2025), understanding an object is not just knowing about the object, nor just mentioning it, but the person must also correctly interpret the known object. Someone who already understands the object or subject should explain and mention it.

The frequency distribution showed that of the 36 elderly people in Lequitura and Aissirimou, Aileu City Administrative Post, Aileu Municipality, the majority of the applied knowledge level was good, 17 people (47.2%), and the minority of the applied knowledge level was low, 4 people (11.1%). From this result, it is shown that the level of knowledge

of the elderly about the prevention of osteoporosis at the age of 60-90 is good because the majority of the elderly completed high school in 16 (44.4%) and completed higher education in 2 (5.6%). According to academic Susanto (2013) cited by Dasani (2019), Application is the ability to use the material that was studied in the right and real situations and conditions. According to Susanto, 2013 cited by (Dasani, 2019; Tilman CB., et al, 2025) that Application means that people who already know the object that exists means they can use or apply the principle they know to the situation or other situations. They apply knowledge using the most appropriate rules, formulas, methods and principles.

Conclusion

Based on the research results presented in the frequency distribution of table 4.7, the elderly people from Hamlet Lequitura and Aissirimou mostly have a Level of Knowledge about osteoporosis prevention with a good category at 55.6%, an adequate category at 41.7% and a lower category at 2.8%.

Based on the research results presented in the frequency distribution of table 4.8, the elderly from Hamlet Lequitura and Aissirimou mostly have a Level of Knowledge about osteoporosis prevention, with a good category at 55.6%, an adequate category at 41.7% and a category below 2.8%.

Based on the research results presented in the frequency distribution of table 4.9, the elderly people from Hamlet Lequitura and Aissirimou mostly have a Level of Knowledge about osteoporosis prevention, with a good category at 47.2%, an adequate category at 47.2% and a category below 5.6%.

Based on the research results presented in the frequency distribution of table 4.10, the elderly people from Hamlet Lequitura and Aissirimou, for the most part, apply the Knowledge Level in the prevention of osteoporosis with a good category in 47.2%, adequate category in 41.7% and low category in 11.1%, according to the research result (Tilman CB., et al, 2025).

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