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The Knowledge and Prevention Treatment of Osteoporosis on Elderly: A Cross Sectional Study

Ezalina[1], Risma Mardayani[2], Deswinda[3] Rina Herniyanti[4]
[1,2,3,4]Health Institute of Payung Negeri Pekanbaru, Indonesia

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Corresponding Author:

Ezalina
Health Institute of Payung Negeri Pekanbaru, Indonesia
email:
ezalina@payungnegeri.ac.id

ABSTRACT

According to the World Health Organization osteoporosis is the second ranked, after heart disease. In the worldwide there are 200 million people with osteoporosis. One cause the osteoporosis is the low public knowledge in preventing osteoporosis. This study aims to determine the relationship of knowledge with osteoporosis prevention to the elderly. Cross sectional research design, with total sample of 84 elderly through the Accidental Sampling technique. The sample size was 84 respondents. The research instrument used the OKAT (Osteoporosis Knowledge Assessment Tool) questionnaire as the knowledge of osteoporosis and osteoporosis prevention measures questionnaire. The data analysis used univariate analysis and bivariate analysis. The results of this study found that the knowledge of the elderly was in high category of 60.7% and the prevention of osteoporosis was in good category of 53.6%. The results of statistical tests obtained p 0.02< 0.05, that Ho was rejected, so it can be concluded that there is a relationship between knowledge and osteoposition prevention measures in elderly. Research recommendations require further research by examining factors that have not been studied to explain the phenomenon and describe the condition of osteoporosis prevention comprehensively.

Keywords: Elderly, Knowledge, Preventive, Osteoporosis.

1. INTRODUCTION

Aging process is a process of disappearing the ability of histological system to repair themselves and maintain their normal structure and function, as they cannot endure the *lesions* or repair damage. Currently, Indonesia's population reaches 269.9 million people, where 28.7 million of the total population or 10.6% are elderly. Along with the elderly are accompanying with the diseases, one of which is osteoporosis [1] [2] [3].

According to the World Health organization osteoporosis is the second ranked, after heart disease as it the world's major health problem, one in three women and one in five men in the age of 50 suffer from osteoporosis, which means that worldwide there are 200 million people with osteoporosis [4] [5]. In 2050 it is estimated that 50% fractures due to osteoporosis will occur in Asia [6] [7] [8]. Osteoporosis in Europe, Japan, and America are amount 75 million people, while in China 84 million people, and there are 200 million osteoporosis sufferers worldwide [9]. Based on the results of data analysis conducted by the Nutrition Research and Development Center of the Indonesian Ministry of Health in 14 provinces shows that the problem of osteoporosis in Indonesia has reached a level that needs to be watch, in amount 19.7%. It causes the tendency of osteoporosis in Indonesia is 6 times higher compared to other countries.

Research by *Internasional Osteoporosis Foundation* (IOF) (2020) revealed that 1 in 4 women in Indonesia in the range age of 50-80 has a risk of osteoporosis. Osteoporosis does not show noticeable physical symptoms until bone loss or fractures in old age [10] [11]. The prevention of osteoporosis can be done with several steps, such as adequatecalcium intake, adequate vitamin D intake through sun exposure, and avoid smoking [12] [13].

Result of a research conducted by Lidiyawati dan Oktaviani (2021) show that there is a relationship between knowledge and osteoporosis prevention behavior, where prevention behavior is only 49%. Some ways to prevent osteoporosis one of them can be done by improving a *bone-friendly diet* by eating healthy and balanced foods such as food or drinks 55-60% some from carbohydrates (found in foods such as rice, cereals, bread, fruit, vegetables, and pasta), meet calcium needs, bask in the heat of the morning sun [14] [15].

According to the Indonesian Ministry of Health (2019) stated that knowledge about osteoporosis is very important to provoke efforts to prevent osteoporosis from early age both for yourself, family and society, as trying to achieve the maximum possible bone density before the age of 34, as the bone density will decrease with age. Therefore, young people must "save" to a strong bone density [12] [16]. As stated on the background, the purpose of the study was to determine the knowledge and preventive measures of osteoporosis in the elderly.

2. METHOD

The study used a cross sectional design. The sample was the elderly who visited Simpang Tiga Health Center in Pekanbaru City with a total of 84 elderly people taken by accidental sampling. The inclusion criteria are elderly people aged of 45 as they agree with the theory that osteoporosis begins to appear in the elderly aged of 50. For variable knowledge using the OKAT instrument (Osteoporosis Knowledge Assessment Tool) [17], while osteoporosis prevention measures use questions adopted from research [18]. Data analysis used univariate to determine the frequency distribution of each variable, while bivariate analysis to determine the relationship between two variables, the variable knowledge about osteoporosis and the variable of osteoporosis prevention measures, the analysis used the chi square test.

3. RESULTS AND DISCUSSION

Results

3.1. Univariate Analysis

Table 1. The Frequency Distribution of Elderly Characteristics

No	Characteristics	Frequency (n)	Percentage (%)
1	**Age**		
	45-59 *(pre elderly)*	46	54.9
	60-74 *(elderly)*	37	44.2
	75 > *(old)*	1	1.2
	Total	**84**	**100%**
2	**Gender**		
	Male	40	47.6
	Female	44	52.4
	Total	**84**	**100%**
3	**Education**		
	Not Graduate from Elementary School	7	8.3
	Graduated from Elementary School	9	10.7
	Junior High School	18	21.4
	Senior High School	23	27.4
	College	27	32.1
	Total	**84**	**100%**

Source: Primary data analysis, 2023

Table 1 shows that 84 respondents in terms of age, more than half (54.9%) were in the age range of 45 -59 (*Pre Elderly),* more than half (52.4%) respondents were female, almost half (32.1%) respondents had college education, almost half (45.2%) respondents worked as housewives.

Table 2. The Frequency Distribution of Respondents Based on The Knowledge Level About Osteoporosis

No.	Knowledge	Frequency (n)	Percentage (%)
1.	High	51	60.7
2.	Low	33	39.3
	Total	**84**	**100%**

Source: Primary data analysis, 2023

Table 2 shows that more than half (60.7%) of respondents own high knowledge as 51 people.

Table 3. The Frequency Distribution of Respondents Based On The Prevention Treatment of Osteoporosis

No.	The Prevention Treatment	Frequency (n)	Percentage (%)
1.	Good	45	53.6
2.	Bad	39	46.4
	Total	**84**	**100%**

Source: Primary data analysis, 2023

Table 3 shows that more than half (53.6%) of respondents own good precautions as 45 respondents.

3.2. Bivariate Analysis

Table 4 The Correlation Between Knowledge and The Prevention Treatment of Elderly About Osteoporosis

Knowledge	The Prevention Treatment						OR	*p* Value
	Good	%	Bad	%	Total	%		
High	33	64.7	18	35.3	51	100	**3,2**	***0.02***
Low	12	36.4	21	63.6	33	100		
Total	45	101.1	39	98.9	84	100		

Source: *Primary data analysis,* 2023

Based on table 4, it is found that there is a relationship between knowledge and osteoporosis prevention measures where *the p* value is 0.02 <0.05 and OR 3.2 which means that individuals who own high knowledge have 3.2 times to take osteoporosis prevention measures compared to individuals with lower knowledge.

Discussion

Based on the table of respondents' characteristics in terms of age, most age is pre-elderly. According to [18] stated that the proliferation and biosynthesis ability of osteoblasts, cells play a role in bone formation, as adults is lower than younger people since the decrease of cell respond to *growth factors* to bind to the extracellular matrix. This results in decreased bone formation capacity. This is in line with research conducted by W. Amelia (2018) entitled the relationship of knowledge and milk consumption in pre-elderly women with efforts to prevent osteoporosis in Baturaja in 2018 found the age of respondents 45-59 as many as 74 respondents (100%). Based on research conducted by Maesaroh and Fauziah (2020) entitled the effectiveness of knowledge in efforts to prevent osteoporosis in women aged of 45-60, found that the age of 45-50 was 18 respondents (31%). In terms of gender, women are found more (52,4%).

Recent research by the *International Osteoporosis Foundation* (IOF), revealed that 1 of 4 women in Indonesia with range age of 50-80 has a risk of osteoporosis. The risk of osteoporosis in Indonesia is 4 times higher than men. This relates to menopause experienced by elderly women, where estrogen levels decrease, which affects calcium in the elderly [19]. In terms of osteoporosis prevention, the level of education has an important role in construct knowledge and skills related to health. Education level can determine how a person collects and understands health information.

Education can build the ability of individuals to always update their health knowledge as a continuous learning process (Wahyuningsih (2091). In terms of work, according to Annisa *et al*., (2019) stated that sufficient physical activity can stimulate the *bone remodeling process.* As the physical activity is can increase the loss of bone mass. For univariate analysis of the picture of knowledge about osteoporosis, 60.7% were highly knowledgeable. Based on the analysis of questions answered by respondents due to regular activity and correct diet can reduce osteoporosis, 84 respondents answered correctly. A good diet must contain the right nutrients to maintain bones and prevent osteoporosis, especially calcium and vitamin D. Adequate calcium can help increase and strengthen bone mass, but only 55% of respondents answered correctly that calcium intake can be obtained by consuming milk. As the results of the study found that 59.8% of the elderly took osteoporosis prevention measures. The results of lidiyawati research (2021) show that there are still mothers who do not prevent osteoporosis at the age of menopause. Intervention is needed to provoke mothers to be interested in preventing osteoporosis through health education as mothers are interested and understand the benefits of osteoporosis prevention [20].

There is a relationship between knowledge and osteoporosis prevention measures. The knowledge of osteoporosis is knowledge includes understanding osteoporosis, risk factors for osteoporosis, osteoporosis prevention and therapy [21]. Knowledge could begin with curiosity of oneself through the process of asking questions to get the truth [22]. Osteoporosis occurs due to the process of bone erosion and unbalanced manufacturing. Bone erosion cells are osteoclasts and osteoblasts, osteoclasts make holes in bone faster than osteoblasts that make new bone fill the holes. Bones have decreased density so that they become brittle and easily

broken [22] [23]. Mubarok (2018) stated that the problem of osteoporosis in elderly is closely relates to the decline in the production of several hormones controlling bone remodeling. The characteristic of osteoporosis is characterized by a decrease in bone strength with risk factors in the form of age, race, female sex, calcium and vitamin deficiency, physical activity and smoking [24]. *Institute of a Medicine* (IOM) recommends that women aged 51 or older and men aged 71 or older consume calcium 1200 mg / day. Vitamin D is also very important in calcium absorption, *Institute of a Medicine* (IOM) recommends women aged 51 or older and men aged 71 or older consume calcium 1200 mg / day. Vitamin D is also very important in calcium absorption, and exercise activities improve dexterity, strength, posture and body balance which will reduce the risk of falling. Early detection can improve dexterity, strength, posture and balance which will reduce the risk of falling. Early detection is also very necessary, by conducting *Bone Mineral Density* screening and spinal imaging [25].

4. CONCLUSION

There is a relationship between knowledge and osteoporosis prevention measures where the p value is 0.02 and the OR is 3.2 which means that individuals who have high knowledge have 3.2 times the risk of osteoporosis prevention compared to individuals with low knowledge levels. Furtherresearch is needed by examining factors that have not been studied in order to explain the phenomenon and picture of the state of osteoporosis prevention in general.

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REFERENCES

[1] M. Montero-odasso *et al.*, "World guidelines for falls prevention and management for older adults : a global initiative," *J. Heal. Syst.*, vol. 3, pp. 140–146, 2019.

[2] F. Genest, S. Lindström, S. Scherer, M. Schneider, and L. Seefried, "Feasibility of simple exercise interventions for men with osteoporosis – A prospective randomized controlled pilot study," *Bone Reports*, vol. 15, 2021, doi: 10.1016/j.bonr.2021.101099.

[3] T. Kitagawa, K. Hiraya, T. Denda, and S. Yamamoto, "A comparison of different exercise intensities for improving bone mineral density in postmenopausal women with osteoporosis: A systematic review and meta-analysis," *Bone Reports*, vol. 17, no. June, p. 101631, 2022, doi: 10.1016/j.bonr.2022.101631.

[4] D. R. Mavar, D. G. Thakrar, and D. S. Mukhi, "Awareness and Knowledge of Osteoporosis in Elderly Individual," *Int. J. Heal. Sci. Res.*, vol. 12, no. 9, pp. 129–133, 2022, doi: 10.52403/ijhsr.20220917.

[5] K. Brooke-Wavell *et al.*, "Strong, steady and straight: UK consensus statement on physical activity and exercise for osteoporosis," *Br. J. Sports Med.*, vol. 56, no. 15, pp. 837–846, 2022, doi: 10.1136/bjsports-2021-104634.

[6] E. M. Ribeiro *et al.*, "Bone health education programs for older people: an integrative review," *Cien. Saude Colet.*, vol. 28, no. 7, pp. 2025–2034, 2023, doi: 10.1590/1413-81232023287.10602022en.

[7] L. M. Giangregorio *et al.*, "Too Fit To Fracture: outcomes of a Delphi consensus process on physical activity and exercise recommendations for adults with osteoporosis with or without vertebral fractures," *Osteoporos. Int.*, vol. 26, no. 3, pp. 891–910, 2015, doi: 10.1007/s00198-014-2881-4.

[8] S. L. Watson, B. K. Weeks, L. J. Weis, A. T. Harding, S. A. Horan, and B. R. Beck, "High-Intensity Resistance and Impact Training Improves Bone Mineral Density and Physical Function in Postmenopausal Women With Osteopenia and Osteoporosis: The LIFTMOR Randomized Controlled Trial," *J. Bone Miner. Res.*, vol. 33, no. 2, pp. 211–220, 2018, doi: 10.1002/jbmr.3284.

[9] N. Julia, N. Rizana, and Ismailinar, "Hubungan Pengetahuan Keluarga Dengan Pencegahan Osteoporosis Pada Lansia," *J. Assyifa' Ilmu Keperawatan Islam.*, vol. 6, no. 2, pp. 1–9, 2021, doi: 10.54460/jifa.v6i2.12.

[10] S. Matoley, K. Khader, and E. El- Sherbieny, "Assessment of Life style for Elderly patient with osteoporosis in Beni-Suef University Hospital," *NILES J. Geriatr. Gerontol.*, vol. 5, no. 1, pp. 16–29, 2022, doi: 10.21608/niles.2022.187827.

[11] I. Miko, I. Szerb, A. Szerb, T. Bender, and G. Poor, "Effect of a balance-training programme on postural balance, aerobic capacity and frequency of falls in women with osteoporosis: A randomized controlled trial," *J. Rehabil. Med.*, vol. 50, no. 6, pp. 542–547, 2018, doi: 10.2340/16501977-2349.

[12] S. Maesaroh and A. N. Fauziah, "Efektifitas Pengetahuan Dalam Upaya Pencegahan Osteoporosis Pada Wanita Usia 45 -60 Tahun," *J. Kebidanan Indones.*, vol. 11, no. 2, p. 127, 2020, doi: 10.36419/jkebin.v11i2.380.

[13] A. J. Nawrat-Szoltysik *et al.*, "Effect of physical activity on the sequelae of osteoporosis in female residents of residential care facilities," *Adv. Clin. Exp. Med.*, vol. 27, no. 5, pp. 633–642, 2018, doi: 10.17219/acem/68381.

[14] Widarsa IKT, Darwata IW, Sarmadi M, Rachmanu MJ, Juwita DAPR, and Pradnyawati LG, "Association

between osteoporosis and age, physical activity and obesity in elderly of Tulikup Village, Gianyar," *Warmadewa Med. Journal)*, vol. 3, no. 2, pp. 2527–4627, 2018, [Online]. Available: http://dx.doi.org/10.22225/wmj.3.2.684.33-42

[15] C. L. Gregson *et al.*, *UK clinical guideline for the prevention and treatment of osteoporosis*, vol. 17, no. 1. 2022. doi: 10.1007/s11657-022-01061-5.

[16] H. M. Vu *et al.*, "Individual and environmental factors associated with recurrent falls in elderly patients hospitalized after falls," *Int. J. Environ. Res. Public Health*, vol. 17, no. 7, 2020, doi: 10.3390/ijerph17072441.

[17] P. Tardi *et al.*, "Pengembangan instrumen yang andal dan valid untuk mengukur pengetahuan terkait osteoporosis : validasi dari Osteoporosis versi Hungaria Alat Penilaian Pengetahuan (OKAT)," vol. 21, no. Suppl 1, pp. 1–9, 2021.

[18] N. N. Annisa, N. N. Hidajat, and E. P. Setiawati, "Hubungan Pengetahuan dan Sikap dengan Tindakan Pencegahan Osteoporosis pada Remaja Puteri di Kecamatan Soreang Kabupaten Bandung," *110 Jsk*, vol. 4, no. 3, pp. 110–116, 2019.

[19] F. Yusnanda and T. A. Pratiwi, "Hubungan Pengetahuan Wanita Menopause Tentang Mencegah Osteoporosis Dengan Mengkonsumsi Kalsium di Puskesmas Rambung Kecamatan Binjai Selatan Kota Binjai Tahun 2022 The Relationship of Menopause Women ' s Knowledge About Preventing Osteoporosis by Consumi," vol. 8, no. 2, pp. 619–625, 2022.

[20] H. Lidiyawati and S. N. Oktaviani, "The Relationship between Knowledge about Osteoporosis and Osteoporosis Prevention Behavior in Premenopausal Women in Cicantayan Village, Cicantayan Health Center Working Area, Sukabumi Regency," Lentera," *J. Heal. Nurs. Sci.*, vol. 4, no. 2, pp. 64–71, 2021, doi: 10.37150/jl.v4i2.1441.

[21] F. Talakua, "Global Health Science," *Glob. Heal. Sci.*, vol. 6, no. 1, pp. 51–56, 2021.

[22] A. Khu *et al.*, "The Relationship between the Level of Osteoporosis Knowledge and Osteoporosis Prevention Actions in Students of FK UNPRI Batch 2019," *Midwife J.*, vol. 7, no. 2, 2022.

[23] D. L. Kendler, F. Cosman, R. K. Stad, and S. Ferrari, "Denosumab in the Treatment of Osteoporosis: 10 Years Later: A Narrative Review," *Adv. Ther.*, vol. 39, no. 1, pp. 58–74, 2022, doi: 10.1007/s12325-021-01936-y.

[24] D. S. Wicaksono and R. Y. Maulana, "Benefits of Dandelion Extract in Preventing Osteoporosis," *Res. J. Prof. Nurses*, vol. 2, no. 2, pp. 155–162, 2020, doi: 10.37287/jppp.v2i2.87.

[25] J. Regina, E. P. Setiawati, and N. N. Hidajat, "The Relationship between Knowledge and Attitudes with Actions to Prevent Osteoporosis in Women of Childbearing Age in Babakan Ciparay District, Bandung City,"," *J. Heal. Syst.*, vol. 4, no. 3, pp. 140–146, 2019.