

Improving the Knowledge of Elderly Cadres in Providing Adequate Phytoestrogen Intake to Reduce the Progression of Osteoporosis

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Abstract. Aging is an inevitable physiological process in life. In women, the aging process will be greatly affected by decreased production of the estrogen hormone so that the metabolism mediated will also experience higher disturbances than in men. Osteoporosis in women is much faster, so to cope with it can be slowed down with a rich intake of phytohormone estrogen. Several studies have proven that many plants have phytoestrogenic properties around us but not many people know about it. The aim of this study is to raise public awareness of bone health through the preparation skills of phytoestrogen-rich food intake. The methods used were lectures, discussions, demonstrations. The results showed an improvement in understanding and skills of 0.6 points. The Conclusion, lecturing and discussion were able to raise awareness despite still very low. However, there is great hope that this knowledge will be passed on through practice to make use of the plant resources available in the surroundings. The future study should modify the method to treat the elderly respondent, also need more time to understand the knowledge better.

1 Introduction

Ageing is a certainty for every human being. The loss of a gradual nature, also known as aging, causes many changes associated with the aging process. Comparisons observed widely between different age groups show that most organs experience a decrease in function of about 1% per year starting at the age of about 30 years. However, other data indicate that changes in older persons age followed overall are less significant and only begin at age 70 years [1–3].

Strength, stamina, and flexibility of skeletal muscles decreased. As a result, the head and neck are reflected forward, while the spine is swollen (kyphosis), the pelvis and knees are also slightly reflected. The condition causes the posture to be disturbed. Health in the elderly is very important to know for several reasons. In older age, the onset of problems may not be an etiological sign, but problems can arise for other reasons. For example, a person suffering from immobilization can be caused by a thoracic fracture, severe angina, or arthritis.

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But it's because of fear. An elderly person who has been treated for a pelvic fracture may not be willing to walk back because of fear of falling back and causing another fracture. Therefore, it is important to know the risk factors that should be avoided and the things to observe in order to stay awake and healthy [4,5].

Several risk factors include, 1) age; the older the age, the more susceptible to osteoporosis; 2) gender; women have a higher risk than men associated with reduced production of the hormone estrogen involved in the synthesis of hard bones. So, women have a two times higher risk of pelvic fractures than men. 3) Genetic/ hereditary; the size of the peak bone mass is largely determined by genetic factors. Women who have a mother who has had a bone fracture in old age are twice as likely to develop osteoporosis, if one of the family members has a history of the disease, then the person has an 80 per cent chance of suffering from osteoporosis, while the remaining 20 per cent depends on other factors, such as exercise and diet [6–8]. Therefore, a family history of bone fractures is very useful in determining a person's risk of developing osteoporosis. 4) Race, 5) Higher parity, higher risk, 6) Hormonal disorders, 7) Food intake, 8) Physical activity. Especially in women who have a higher risk than men due to the availability of the hormone estrogen, it is important to have adequate intake of foods that have properties similar to the estrogen known as phytohormones. There's a lot of vegetables or phyto-hormone seeds around us. So it's important to raise awareness in understanding any plant that has phytohormone properties [9].

Currently, a lot of research has been done on the use of phytohormones or natural ingredients that contain hormones. One of them is phytoestrogen, which is a plant substrate that has activity similar to estrogen. Phytoestrogens are also considered a great alternative to reducing bone marrow caused by estrogen deficiency. Phytoestrogen is a compound found in plants that has estrogen-like properties. By its similarity to estrogen, isoflavones, lignans, *coumestane*, stilbene, flavonoids quercetin, and kaempferol are commonly included in the category of phytoestrogens. Oleanolic acid, botulinic acid, and triterpenoid *ursolic* acid have been studied in vivo and in vitro to function as therapies for estrogen deficiency and aging processes that cause bone loss [7,8]. There is evidence that triterpenoids can stimulate osteoblastic cells to enhance bone formation. Triterpene glycoside also has an estrogenic effect. Phytoestrogen prevents osteoporosis by stimulating the activity of osteoblastic cell formation and preventing the formation of osteoclasts. It's similar to estradiol, the most usable form of natural estrogen. Phytoestrogen can stimulate osteoblast to stimulate protein synthesis and release alkaline phosphatase in vitro. The purpose of using natural plants that contain phytoestrogens is to control and anticipate osteoporosis. Red gedi leaves are one of the plants consumed and empirically used as a medicine in Indonesia soybeans are rich in Genistein and daidzein and many isoflavones that are similar to estrogen. There's a lot of this compound in *Bengkung* [8,9].

Tegalpanggung 3 is an area located on the slopes of the Code River, with a fairly dense population. In this area there is a *posyandu* (Integrated health care Center) for the elderly, and there has never been any education about preventing the worsening of osteoporosis by increasing knowledge about food sources that are high in phytoestrogens.

People don't know much about phytohormone-based plants that reduce the high risk of osteoporosis. But the plants that contain the phytohormone estrogen are very close to them. Besides, it's been quite a long distance of discernment about the relationship between age and the occurrence of osteoporosis ever done. So, it feels very necessary to re-improve the sense of calm bone health in the elderly and the phytoestrogens. The aim of this activity is to increase people's skills and knowledge about the prevention and adequate intake of foods high in phytoestrogens to reduce osteoporosis in the elderly.

2 Methodology

This research was conducted in Tegalpanggung 3 Kota Yogyakarta. Subjects were 73 elderly. All are member of *Posyandu* of elderly Tegalpanggung 3 Yogyakarta. Method used to determine the level of knowledge with lectures followed by discussions about the Knowledge of Osteoporosis and Phytoestrogen for bone and skill to choose the plant contains phytoestrogen. Data analyzed using t test to compare pre and post-test about the knowledge also the skill. Correlation test between variable of age, Pretest, posttest, occupations, also education level.

3 Results and Discussion

The average age of elderly in DIY is the highest compared to the national average, while the number of elderly in Yogyakarta is rising year after year, the last record of about 14,4% of the city's population [10]. The study was carried out at Tegalpanggung 3, with 73 elders present but the completed data was 48 respondents. Participants' characteristics as in table 1 below.

Table 1. The characteristic of participant

Characteristic of participants (N =48)			Percentage
Gender	Male	27	56,23
	Female	21	43,75
Age (years old)	40-50	3	6,25
	51-60	13	27,08
	61-70	26	54,16
	71-80	4	8,33
	81-90	2	4,16
Education	Elementary School	16	33,33
	Midle School	6	12,5
	High SChool	26	87,5
Occupies	none	7	14,58
	labor	10	20,83
	House wife	12	0,25
	Farming	2	4,16
	Others	17	35,42

The number of male and female participants is almost equal, the education level is the highest in High school and the maximum age is 70 years. Mostly the age around 61-70 years old. The average score pretest and posttest to measure the effect of lecturing as shown in table 2. The increasing score point was 0,60 or 8,57 %. Most of participant difficult to understand the knowledge of osteoporosis. The score of knowledge as shown on pre and posttests is very low. This situation similar with community at Sukur Village North Minahasa Sulawesi even the age of participant around 25-45 years old [11]. But different with participant in Mojokerto that the age around 40-60 years old had a good knowledge on

osteoporosis [12], either with participant in Juwiring Klaten in age 45-60 [13]. Also, in Panti Wreda X Yogyakarta mostly had a good knowledge on osteoporosis [14].

Table 2. The average of score pre and posttest in scale and in percentage

	Score	
pre	2,67± 1,28	38,14±18,28 %
post	3,27±0,227	46,71±3,24 %

The effect of lecturing about osteoporosis and phytoestrogen also skill to choose plant with phytoestrogen as shown in figure 1. The participant maybe for first time have the lecturing about osteoporosis also the plant that contain of also skill phytoestrogen. The words seem unfamiliar for them. But this lecturing increases their knowledge and skill. Good knowledge is important to applicate as behavior and able to delay osteoporosis. There were significant different about the knowledge and good behavior on osteoporosis at Malahayati student also good correlation among age and knowledge of osteoporosis in Arab Saudi [7,15,16]. The knowledge of a good participant tends to be positive in every action. Good knowledge extends the vision, so that one will understand all his needs and know to strive to keep his body healthy. The good knowledge of osteoporosis reflect on their effort to prevent worsen osteoporosis such as consume calcium, exposure to sunlight [16,17].

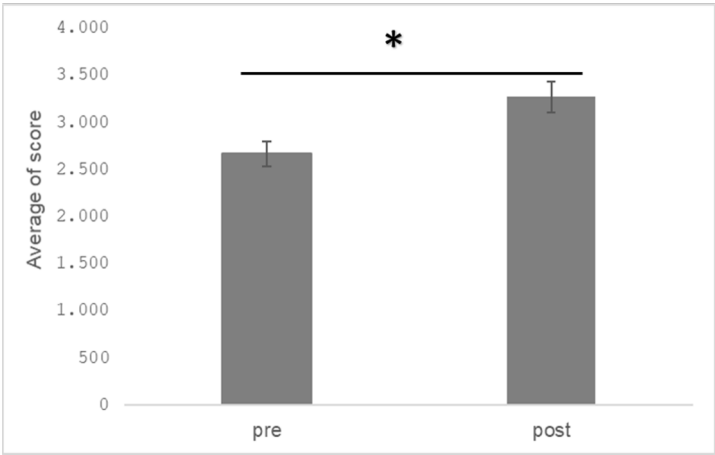


Fig. 1. Graph of the average score pre and posttest. (*) T test showed significant difference, $p < 0,05$

T test showed significant different between pre and posttest. Even the base knowledge and skill of participant at 2.67 but lecturing and demonstrating able to raise 0,6 . This study too difficult for participant event at other place appropriate but at this area, it seem need more time to change the knowledge and skill for participant to make better due to the participant characteristic. Also, the methodology how to transfer knowledge and skill need some modification for future study. Meanwhile correlation test showed that there was no significant correlation between age to pretest, posttest also education level and occuppies. But that was significant correlation between pretest and posttest. This mean if pretest was low so posttest also low.

Table 3. Correlation test between age, pretest, post-test and education level

		age	Pre	Post	Edu	Occupies
age	Pearson Correlation		-.094	-.182	-.008	.017
	Sig. (2-tailed)		.525	.216	.959	.909
	N		48	48	48	48
Pre	Pearson Correlation			.718**	.179	.135
	Sig. (2-tailed)			.000	.225	.361
	N			48	48	48
Post	Pearson Correlation				.069	.027
	Sig. (2-tailed)				.639	.856
	N			48	48	
Edu	Pearson Correlation				.086	
	Sig. (2-tailed)				.563	
	N				48	
**. Correlation is significant at the 0.01 level (2-tailed).						

This result was different with previous study that no correlation between behaviour of osteoporosis and knowledge of osteoporosis on elderly at Padang Timur Kota Padang but similar result to the teenager . The knowledge of osteoporosis and prevention behaviour of osteoporosis in elderly were significant correlation in area PUSKESMAS (Tanoyan Papua. The Good knowledge of osteoporosis was on elderly with age 60-80 years old at Lumajang east of Java, and it had correlation with the fall prevention on elderly.

4 Conclusions

The Lecturing and discussion were able to raise awareness despite still very low. However, there is great hope that this knowledge will be passed on through practice in order to make use of the plant resources available in the surroundings. The future study should modify the method to treat the elderly respondent, also need more time to understand the knowledge better.

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