

# Awareness on Knowledge of “Cadres” in Measuring Anthropometry at Post Services Elderly

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# Awareness on Knowledge of “Cadres” in Measuring Anthropometry at Post Services Elderly

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## ABSTRACT

The awareness of someone's ability to maintain and to keep life has become better; hence having longer life expectation became a grace and a pride. It is estimated that life expectation figures maximally up to 125 years. This tendency increment on elderly population shall take special attention especially on their quality life improvement so that they can maintain their health. Anatomy changes take place on elderly. Elderly body shape for male or female happen to decrease in height that is 5% shorter compares to the age of 20, which is caused by many factors like hunchback and spine bending due to osteoporosis, kifosis because of aging process and other sickness' effect. The role of health “cadres” is very important in medical services for elderly society through post services elderly. It is found through verbal interview at post services elderly by health “cadres” that had difficulty to measure anthropometry the height of elderly due to dysfunction equipment. Skill training in using ergonomics knee high anthropometry is proven to increase knowledge and skills in determining the nutritional status of the elderly. Having design height measurement of knee ergonomic to all health “cadres” is much convenient when measuring height of the knee take place, to determine nutrient status for elderly

**Method:** This research is an experimental with treatment by subject design and 50 respondents from cadres post services elderly in Denpasar Bali. Samples are given two treatments, Pretest (sample using the old measurement) and Posttest (sample using ergonomic design height measurement of knee).

**Result:** on the average cadres post services elderly, in regard with measuring anthropometry is experiencing increase in score as much as 24,36 with grade  $p < 0,000$ . Satisfaction utilizing equipment as much as 20,36 with grade  $p < 0,000$ .

**Keywords:** Awareness, knowledge, anthropometric, post services elderly.

## INTRODUCTION

The success of national development has caused the rising life expectancy at birth, from 68.6 in 2004 to 70.6 in 2009. Population ageing has grown rapidly, especially in the developing countries in the first decade of this millennium. In 2010, the proportion of the elderly population was around 24 million and in 2020 it is estimated to be about 30-40 million<sup>1</sup>. Elderly is a person

who has reached 60 years of age. Awareness of one's ability to maintain and sustain his/her life is getting better, so that having a longer life expectancy is reasonable. Today's elderly is no longer happens to have a long life, but due to the success of development and most of those elderly people are rich, healthy, highly educated, former officials like former ministers, director generals, governors, regents, and other officials. The number of elderly population and their rapid growth cause various problems, so that the elderly need to get serious attention from all sectors in order to improve their welfare. The role of health cadres is very important in health services in community level through Health Centre for Older

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People<sup>2</sup>. From result of the interview in the health centre post for older People, some health cadres<sup>15</sup> found it difficult in anthropometric measurements of the elderly height caused by inappropriate measurement tools. With ergonomic design of knee height it is comfortable to the health cadres to perform knee height measurements to determine the nutritional status of the elderly.

## MATERIALS AND METHOD

### Elderly

Elderly is the final stage of the aging process, characterized by declining physical abilities, which began with a few changes in life. Elderly people tend to experience decreasing physical, psychological, and social condition<sup>3</sup>. Wear and Tear Theory: cells become damaged because they are used and misused too often. Organs' function, such as liver, stomach, kidney, skin, and others is decreased due to toxins contained in the food and environment, excessive consumption of fat, sugar, caffeine, alcohol, and nicotine, ultraviolet light, as well as physical and emotional stress. The damage is not only confined to the organs, but also occurs at cellular level. Therefore, when the body grows older, the cells feel the effects, regardless of how healthy one's lifestyle is. DNA damage: The process that is thought to underlie aging is the imperfect molecular repair and as a consequence, there is an accumulation of molecular damage all the time. The damage can be in form of broken DNA thread, covalent bond formation, and chromosomal rearrangements. The cause of molecular damage can come from both internal and external. Internal causes include free radicals and glycosylation, whereas external causes cover radiation, pollution, and gas and chemical mutagens. DNA damage accumulates over time until severe damage occurs compared to its normal condition. Free radical hypothesis: This hypothesis received greater attention since the use of antioxidants is believed to inhibit free radical damage. Free radicals are molecules produced as byproduct of the normal cellular metabolism, such as superoxide radicals, hydroxyl, and pyrimidine. The main molecules in the body that is damaged by free radicals are DNA, lipids, and proteins. In addition, free radicals also damage collagen and elastin, a protein that keeps skin moist, smooth, flexible, and elastic<sup>4</sup>.

### Psychological Change

Anatomical changes in the elderly affect almost

all anatomical body composition, and changes in cells function of cells, tissues, or organs. Physiological changes that occur in the elderly are as follows:

Human's optimal physical ability is achieved at the age of 25-30 years, while physiology capacity will decrease 1% per year after passing its high point. Aging process is characterized by weaken body, slower and less force full movement, decreased body balance, and the decreasing reaction. After age of 60, one's physical capacity will be decreased by 25%, characterized by the decrease of muscle strength, while sensory and motoric abilities are reduced by 60%.<sup>5</sup>

The decline in the elderly nervous system is characterized by the continuous death of the brain cells, start from age 50. This condition results in the lack of blood supply to the brain. The decrease of nerve conduction velocity is caused by the degeneration of nerve's ability to convey impulses from and to the brain, sensory sensitivity, and skin sensitivity<sup>5</sup>.

The decrease of muscle strength in the elderly includes: the decrease of the hand muscle strength (16-40)%, varied depends on one's level of physical fitness. Hand grip strength decreases by 50%, and arm muscle strength decreases by 50%. The strength and movement in the elderly's body declines due to the decreased function of the motoric organs function, stimulus, sensory organs, the motor neurones, the level of physical fitness (VO<sub>2</sub>max), and muscle contraction. The lower thigh muscle weakens faster than muscles of the hand. Arm muscles will be more intensively used than leg muscles<sup>6</sup>.

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The decreased gestures so that elderly often have accident while doing their activity. The decrease of body coordination will disturb the elderly in coordinating activity and 25% of the elderly had almost fallen (near miss) in the bathroom. Though, this condition is an early sign of the elderly's coordination control system degeneration and need to be watched. Degeneration process of the cartilage and muscle cause decreases

mobility and increases risk of injury. Therefore, the most important thing is the elderly's activity should not require muscular strength, endurance, speed, and flexibility. 50% of human's power is lost at the age of 65, but the strength of hand's muscle only decreases at 16%<sup>6</sup>

### Anthropometric

Anthropometric measurements of height and weight then calculate the body mass index (BMI). BMI is calculated by dividing weight (in kilograms) by height squared (in square meters). Normal BMI for elderly woman is 17-23, whereas for elderly men is 18-25. The anthropometric measurement of height in the elderly men is often not precise due to height reduction caused by spinal compression, kyphosis and osteoporosis. For the height measurement, it is recommended to use knee height measurement to determine the exact height of a person. The knee height will not be reduced unless there is a fracture. BMI is useful as an indicator to determine the indication of KEK (Chronic Energy Deficiency) and overweight (obese)<sup>2,3</sup>.

### Research Design

Type of the research design used is an experimental with treatment by subject design and 50 respondents from cadres in Denpasar Bali. Samples are given two treatments, Pretest (sample using the old measurement facility) and Posttest (sample using the new design height measurement of knee ergonomic tools). Knowledge and skills improvement is measured using pre-post test questionnaire and tools. The data were analyzed using t test with significance level of 5%.

## RESULTS AND DISCUSSION

Subjects of this research were 50 elderly cadres of health centre Denpasar, with 49 of the cadres having high school education level and 1 cadre has Bachelor degree. Cadres of the health center should get information through anthropometric training. Cadres should be informed that physical changes occur in the elderly, and they are not able to stand for a long time. Therefore, they need to do knee height measurement to find out the body height. Ergonomic knee height measurement is really helpful to provide reliable results by avoiding injury and fatigue to the elderly and helping the cadres to work naturally without bowing and reducing inclination. The measurement uses left knee, an exception to the elderly with left foot disabilities. Chumlea formula that is used

to calculate the measurement is; for women:  $\text{Height} = 140.00 + (1.91 \times \text{Knee Height}) - (0.17 \times \text{age})$  and for men:  $\text{Height} = 59.01 + (2.08 \times \text{Knee Height})$ . To measure the body mass index in the elderly, first should be found out the anthropometric height<sup>7</sup>.

**Table 1: Knowledge and skills of the Health Centre Cadres Regarding Anthropometry**

Variable			P
Knowledge	Pre test	18,69	0.000
	Post test	43,05	
Skill of Tools Usage	Pre test	14,18	0.000
	Post test	34,54	

Based on the analysis, the average knowledge of the health centre cadre regarding anthropometric measurements can be concluded. There are differences in knowledge before and after the training, in which there is an increase of 24.36 with a probability value ( $p < 0.000$ ). There is an increase of 20.36 for the skill of using Anthropometric tools, with a probability value ( $p < 0.000$ ). Cadres of the health centre provide service to the elderly in the community, and pay attention to the early health of the elderly through their nutritional status, knowledge about character, capacity, and limitations of the elderly. Ergonomics measurement tools are required for knee height anthropometric to find out the elderly's height<sup>8</sup>. Physical limitations of the elderly often require an ergonomist to look for the other techniques to achieve the goal, such as figuring out how to get the height anthropometry of the elderly since the elderly's physical condition inhibits them from long standing<sup>9</sup>. The purpose of the Special for Elderly application are: (1) to improve physical and mental welfare, particularly to optimize the elderly's safety and health by preventing illness, reducing both physical and mental burden; (2) to increase social welfare by improving the quality of social contacts, managing and optimizing the comfort and accessibility aspects to a high quality of life<sup>10,12,13</sup>.

## CONCLUTIONS

Elderly require special treatment due to a decrease in physiological capability<sup>13</sup>. Cadres of elderly health centre have a major role to determine the nutritional status of elderly in the community. Cadres should be



given the introductory knowledge and skills to use anthropometric tools to determine nutritional status as a preventive effort. Cadres training conducted in Denpasar Bali provided them knowledge. Skill training in using knee high anthropometry is proven to increase knowledge and skills in determining the nutritional status of the elderly.

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**Conflict of Interest:** All authors declare that there is no any conflict of interest within this research and publication including the final agreement.

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