

Characteristics of Nutritional Status and Nutritional Forming Bone Adequacy Levels in Women

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ABSTRACT

Women must prepare themselves with adequate and quality nutrition that they can meet the needs of themselves, the fetus and when breastfeeding, so that children will grow well and prevent the risk of osteoporosis. Objective: to study the nutritional status and adequacy level consumption of bone-forming nutrients in women. Methods: descriptive observational analytic, cross sectional study design. Section of The Cohort Study for Children Growth and Development. Analysis data from baseline non-pregnant women period of time 2015-2018 (1532 respondents). Results: Nutritional status in half of the respondents were in normal. Thin is most in adolescents (14.9%). Enough energy consumption in adolescents is 10.6%, adults 14.3% and elderly 24.1%. Protein consumption is sufficient in adolescents, adults and the elderly respectively 14.5%, 30.5% and 29.6%. Ca consumed according to adequacy is in 1-4% respondents. Mg and P were sufficient in 27.7% and 12.8% of adolescents, 17.6% and 53.2% of adults and 16.7% and 43.5% of the elderly. All respondents consumed vitamins less than adequacy (C, D and B12). Conclusion: about half of respondents have normal nutritional status. Respondents who consume according to adequacy are still very low (energy, protein, Ca, Mg, P), all respondents inadequacy of vitamins C, D and B12. The proportion of thin and inadequacy levels of bone-forming nutrition are most common in adolescents. Recommendations: need preventive policies so that people do a healthy lifestyle and consume according to the recommended adequacy.

Keywords: *adequacy level of nutritional consumption, nutritional status, nutritional consumption*

1. INTRODUCTION

Women play an important role in creating quality of next generation. Human quality is determined from the beginning of the fetus growing [1]. The results of several studies in Indonesia found that low pre-pregnancy weight correlated with low weight gain during pregnancy [2], resulting in an increased risk of preterm birth, low birth weight (LBW) and low birth length (LBL) [3,4].

The results of the 2013 Basic Health Research of Indonesia (Riskesdas) indicate that there are nutritional problems in Indonesian women and children. The problem is: thin status in women based on body mass index (BMI) of 10.1 percent. The nutritional status of low birth weight (LBW) infants is 10.2 percent and babies with low birth length (<48 cm) is 20.2 percent [5].

Women have lower bone mass and lose bone mass faster than men [2]. Achieving the peak of optimal bone mass formation that is maintained will be able to prevent osteoporosis in the future [2]. Various kinds of nutrients play a role in the formation of bone structure, metabolism and bone strength. These nutrients are needed for bone formation and maintain a balance between formation and

resorption of bone. The main nutrient for bone forming is calcium (Ca). Calcium is a specific nutrient for achieving optimal peak bone mass [11]. Other nutrients, protein, protein intake has a beneficial effect on bone condition [7]. Other nutrients include vitamins and minerals, including magnesium, fluorine, zinc, copper, boron, manganese, phosphorus, potassium, vitamins A, D, K and C [8].

This research aims to study nutritional status and adequacy level consumption of bone-forming nutrients in women.

2. METHOD

This research was an analytic descriptive observational study with a cross sectional study design. This research is part of the Cohort Study of Child Growth and Development conducted by the Center for Research and Development of Public Health Efforts, NIHRD RI. Data was collected in five villages in sub district Central Bogor. Data collection in period 2015-2018, there were 1532 female respondents data were analyzed.

Samples were non-pregnant women at the baseline in the Cohort Study. Data were collected by interview using a structured questionnaire, recall consumption 1 x 24 hours,

and measurements of weight and height. Nutritional status is obtained from the calculation of body mass index (BMI). The level of nutrient consumption is obtained by comparing the consumption of nutrients with the recommended dietary allowance (RDA) of Indonesia [9]. Categorizing the level of nutritional adequacy for energy and protein are inadequate (<90%) and adequate ($\geq 90\%$). The categorization of vitamins and minerals group is less (<77%) and sufficient ($\geq 77\%$) [11,12].

Ethics approval was obtained from the Ethics Commission of the National Institute of Health Research and Development, Ministry of Health of the Republic of Indonesia, No. LB.02.01/ 5.2/ KE.135/2015 dated March 9, 2015.

3. RESULTS AND DISCUSSION

An illustration of the nutritional status of the sample is shown in the following figure:

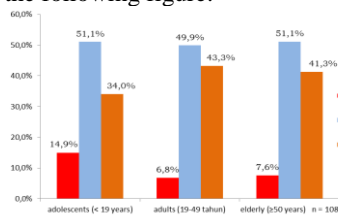


Figure 1. Women's Nutritional Status

It appears that about half of the sample in all age groups is in normal nutritional status. Thin condition is most common in adolescent age groups (<19 years). This needs to be a concern for the government because thin condition before pregnancy is associated with weight gain during low pregnancy and finally children born at risk of low birth weight and or low birth length [13,14,15].

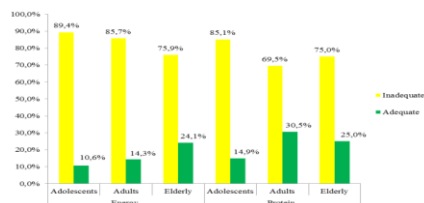


Figure 2. Categories of Adequacy Levels of Energy and Protein Consumption

In the picture it appears that in general the sample is still lacking in energy and protein consumption. The proportion of respondents who consumed inadequate energy and protein was mostly found in the young age group, which was 89.4% inadequate energy and 85.1% inadequate protein. The food that consumed does not only contain a single nutrient but also a variety. The higher a person's energy intake, the higher the intake of other nutrients, especially phosphorus and protein [13]. Low bone density conditions are often found in people with low energy intake [13]. The protein consumed plays a role in providing amino acids to build bone matrix and influences bone growth [13].

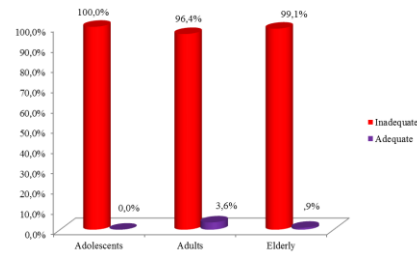


Figure 3. Category of Adequacy Levels of Calcium Consumption

This study found that the level of calcium consumption in the category adequate only in the range of 1-4% of respondents in all age groups. Some studies have also found less calcium consumption. Setyawati's study found that about 90% of respondents (aged 25-45 years) did not consume enough calcium [19]. Calcium intake is very important because the calcium consumed is very influential in bone formation. If the amount of calcium in the blood is not enough, then calcium reserves in the bones will be taken [20]. If it persists it causes a decrease in bone density and at risk of osteoporosis.

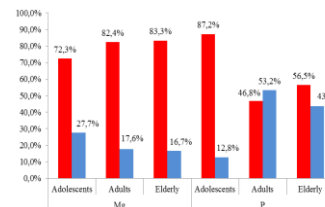


Figure 4. Categories of Adequacy levels of magnesium and phosphorus Consumptions

In general, phosphorus consumed is still inadequate. Adequate phosphorus is consumed by 12.8% of adolescents, 53.2% of adults and 43.5% of elderly. Though phosphorus plays an important role because phosphorus is involved in activating various reactions in metabolism [21]. Phosphorus is also associated with bone density conditions, it is expected that phosphorus is consumed in sufficient quantities and supported by adequate protein and calcium intake [22].

Adequate magnesium consumption only by 27.7% of adolescents, 17.6% of adults and 16.7% of elderly, whereas magnesium also plays a role in bone formation. Magnesium plays an important role in the process of calcium and bone metabolism by increasing calcium absorption. Magnesium deficiency will alter calcium metabolism resulting in hypocalcemia and abnormal vitamin D metabolism [23].

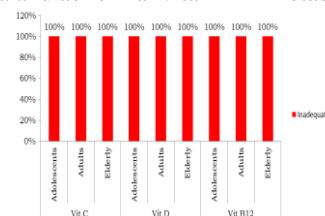


Figure 5. Categories of Adequacy levels of vitamins C, D and B12 Consumptions

The picture above shows that all respondents, did not consume vitamins C, D and B12 in accordance with the recommended adequacy. Vitamins A, C, and D are needed in the process of bone mineralization and prevent a decrease in bone density [24].

4. CONCLUSION

About half of respondents have normal nutritional status. thin is most in adolescents (14.9%). The proportion of respondents who consume enough energy, protein, calcium, magnesium, phosphorus is still very low. All respondents did not consume enough vitamins C, D and B12. The proportion of lean and less adequate levels of bone-forming nutrition is most common in adolescents.

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