

# DokTin Medika

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## NUTRITION EDUCATION AS AN EFFORT TO INCREASE IMMUNITY DURING THE COVID-19 PANDEMIC

### *Penyuluhan Gizi Sebagai Upaya Meningkatkan Imunitas Di Tengah Pandemi Covid-19*

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#### ABSTRACT

**Background:** The Covid-19 pandemic in Indonesia is starting to increase again with the emergence of the omicron variant SARS-Cov2. Efforts are needed to increase immunity, one of which is by providing nutrition education to the community. **Purpose:** Increase knowledge about nutrition to improve immunity. **Methods:** This was a cross-sectional descriptive study among Aisyiyah member of the Bumiayu branch. Education about nutritional knowledge is given, pre-test and post-test is also performed using questionnaire. Total score was analysed using paired t test. **Results:** The mean value of nutritional knowledge was initially 67.37 and increased to 78.95 after receiving education. The change in knowledge was statistically significant ( $p = 0.002$ ). **Conclusion:** The education provided has been shown to have a positive impact on nutritional knowledge to increase immunity.

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#### ABSTRAK

**Latar belakang:** Pandemi Covid-19 di Indonesia mulai meningkat kembali dengan ditemukannya varian Omicron SARS-CoV2. Diperlukan upaya-upaya untuk meningkatkan daya tahan tubuh, salah satunya dengan penyuluhan gizi pada masyarakat. **Tujuan:** Meningkatkan pengetahuan gizi untuk meningkatkan kekebalan tubuh. **Metode:** Merupakan studi deskriptif cross-sectional pada anggota Aisyiyah ranting Bumiayu dan diskriminasi diberikan, pre-test dan post-test menggunakan kuesioner. Skor total dianalisis menggunakan uji t berpasangan. **Hasil:** Nilai rerata awal 67,37 dan meningkat pada post-test 78,95. Perubahan pengetahuan tersebut signifikan secara statistik ( $p = 0,002$ ). **Kesimpulan:** Edukasi yang diberikan terbukti memberikan dampak positif terhadap pengetahuan gizi untuk meningkatkan imunitas tubuh.

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**INTRODUCTION**

The Covid-19 pandemic is still ongoing. This virus has the potential to mutate which changes its nature to become more infectious and deadly. WHO, in collaboration with partners, expert networks, national authorities, institutions and researchers has been monitoring and assessing the evolution of SARS-CoV-2 since January 2020. During late 2020, the emergence of variants that increase global public health risks led to the characterization of Variants of Interest (VOI) and Variants of Concern (VOCs), to prioritize global monitoring and research, and ultimately to inform the ongoing response to the Covid-19 pandemic (WHO, 2021). Currently, a new variant has emerged, namely the Omicron variant which is estimated to have great infectious ability. Prevention efforts are needed, one of which is by increasing immunity through improved nutrition. Good nutrition will increase the body's resistance to Covid-19 infection. However, not all levels of society have sufficient knowledge about good family nutrition. Many people just eat to be full, without heeding the quality of their diet that can support the body's immunity.

**METHOD**

**Design:** This was a cross-sectional descriptive study among Aisyiyah member of the Bumiayu branch. Education about nutritional knowledge is given, pre-test and post-test is also performed using questionnaire.

**Outcome:** Changes in nutritional knowledge to increase body immunity

**Sample:** The population of this study were all member of Aisyiyah Bumiayu Malang, who came to Aisyiyah meeting in December 18<sup>th</sup>, 2021.

**Data Analysis:** Descriptive data is presented in the form of text and tables. Total score was analysed using paired t test.

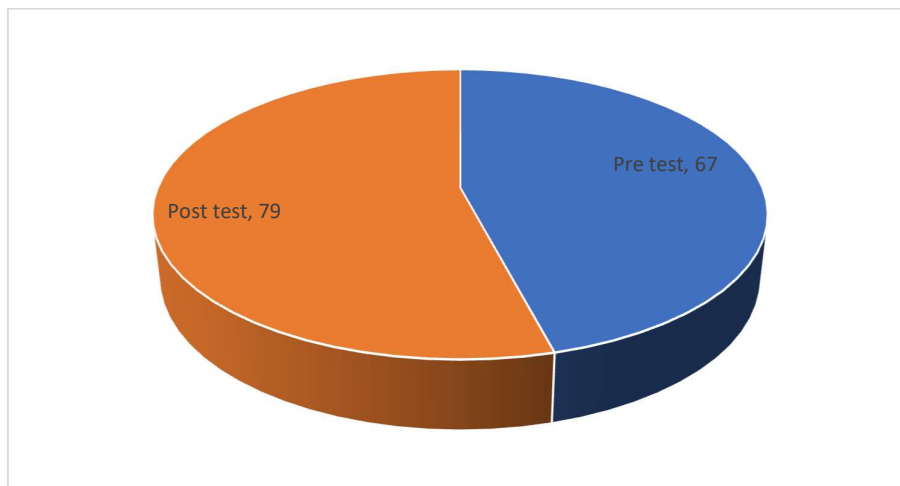
**RESULTS**

Demographic data in this study found the average age of respondent are around 31- 67 years. The initial mean value before education was 67.37, and after that it seemed to increase by 78.95.

**Table 1**

Pre-test and Post Test Results of Questionnaire of Nutritional knowledge

| No. | Question Topic  | Correct Answer (%) |           |
|-----|---|--------------------|-----------|
|     |   | Pre-test           | Post-test |
| 1   | The main food as energy source                            | 89                 | 89        |
| 2   | Types of foods that are rich in antioxidants and vitamins | 63                 | 73        |
| 3   | Types of foods that are rich in ascorbic acid             | 73                 | 94        |
| 4   | Types of foods that are rich in iron                      | 57                 | 68        |
| 5   | Guide to balanced meal on the dinner plate                | 52                 | 68        |



**Figure 1.** The Mean Value of Pre-Test and Post-Test

The results of the nutritional knowledge among respondents increased after receiving education. The change in knowledge was statistically significant ( $p = 0.002$ ), which means that the education provided was able to change the nutritional knowledge to be better (see table 2).

**Table 2**  
Paired T Test Analysis

| Total Score | Mean ± sd     | P value |
|-------------|---------------|---------|
| Pre-test*   | 67.37 ±22.32  | 0,002   |
| Post-test*  | 78.95 ± 15.59 |         |



**Figure 2.** Photo of participants



**Figure 3.** Presentation photo**DISCUSSION**

Knowledge of the main food as a source of energy in the respondents was good with an average value of 89 for the pre- and post-tests. The main food source of energy for the Indonesian population is generally rice. But there are many types of food sources of other energy. Fat and protein also serve as a source of energy. One of the best ways to live a healthy lifestyle and maintain a healthy weight is to eat foods that sustain energy levels throughout the day (Whitbread D, 2021).

A balanced diet is important to build a strong immune system to protect against viral infections, and to provide additional protection for the body. The guide in the daily dinner plate consists of staple food sources of carbohydrates (rice, corn, potatoes, tubers); side dishes as a source of protein and minerals, can come from animal (meat, fish, chicken, eggs) and vegetable (tofu, tempeh, nuts); as well as vegetables and fruit which are sources of vitamins, minerals and as well. Colorful vegetables and fruits are a source of vitamins and function as antioxidants, namely vitamins A, C, and E. (Ministry of Health RI, 2020).

Knowledge about foods rich in antioxidants and vitamins seemed to increase after the counseling. The average pre-test score was 63 and increased by 73 in the post-test. The food consumed needs to be added with fruits and vegetables. These fruits and vegetables are rich in antioxidants which are important for the immune system. There are three main antioxidant vitamins, namely beta-carotene, vitamin C, and vitamin E. These antioxidants are often found in colorful fruits and vegetables, especially purple, blue, red, orange, and yellow (Dunkin MA, 2021). It is necessary to increase the consumption of fruits such as: bananas, oranges, avocados, pineapples, apples, papaya, mangosteen, etc. Vegetables rich in fiber can also maintain immunity: green leafy vegetables, eggplant, bean sprouts, cassava leaves, etc. (Ministry of Health RI, 2020).

Vitamins needed in food are: 1) Vitamin A, which is a fat-soluble nutrient. This vitamin is important in healthy teeth, bones, soft tissues, and skin. Vitamin A also helps in the defense against bacterial and viral infections, prevents night blindness, and keeps hair and nails healthy. The recommended dietary allowance (RDA) is 900 mcg for men, 700 mcg for women and 300–600 mcg for children and adolescents (Arnarson A, 2017). Foods rich in vitamin A include carrots, sweet tubers, pumpkin, cantaloupe, apricots, spinach, kale, and mustard greens. Some spices also contain vitamin A such as paprika, red chili, cayenne pepper, and chili powder; 2) Vitamin B. Vitamins B-6, B-12, and B-9 are essential vitamins for good nerve function, DNA synthesis, and the formation of red blood cells. This vitamin also maintains brain function, prevents anemia, and supports metabolism. The recommended dietary allowance (RDA) of vitamin B6 is 1.3 mg/day (Felson, 2020). Foods rich in vitamins B-6 and B-12 include meat, poultry, fish, seafood, eggs, and dairy. Foods rich in vitamin B-9 or folic acid include green leafy vegetables and poultry. Some breakfast cereals, fruit juices, and other products are fortified with folic acid; 3) Vitamin C, also known as ascorbic acid. This vitamin is a powerful antioxidant that protects cell health, helps increase iron absorption, is important in dental and gum health, wound repair, and the body's defense against infection. The recommended dietary allowance (RDA) is 90 mg/day for men, 75 mg/day for women (Felson, 2020). Foods rich in vitamin C include the following: papaya, oranges, strawberries, bell peppers, broccoli, cabbage, dark leafy vegetables such as kale, mustard greens, and turnips; 4) Vitamin D, this vitamin can be obtained from what we eat, but the body can also synthesize it from sunlight. This vitamin is important for bone health and the immune system. The recommended dietary allowance (RDA) is 15 mcg/day (600 IU) for 1- to 70-year-old (Felson, 2020). Foods rich in vitamin D are some seafood such as salmon, herring, catfish, trout, and oysters, milk, eggs, and shiitake mushrooms; 5) Vitamin E, like vitamin C, vitamin E is also a powerful antioxidant. This vitamin protects cells from damage, helps the body use vitamin K, and repairs muscle cells. The recommended dietary allowance (RDA) is 22.4 IU/day (15 mg/day) (Felson, 2020). Foods rich in vitamin E are sunflower seeds, almonds, spinach, radishes, bell peppers, and asparagus; 6) Vitamin K, this vitamin is important in the formation of blood clots, also helps maintain bone strength in the elderly. The recommended dietary allowance (RDA) is 120 mcg for 19 years old male, and 90 mcg for 19 years old females (Rosenbloom M, 2020). Foods rich in vitamin K are kale, spinach, mustard greens, radishes, mustard greens, parsley, cabbage, broccoli, and asparagus. (Butler N, 2017)

Knowledge about foods rich in vitamin C seemed to increase after the counseling. The mean pre-test score was 73 and increased by 94 in the post-test. Vitamin C protects the body from infection by stimulating the formation of antibodies and immunity. Vitamin C is found in berries, broccoli, cabbage, melon, cauliflower, oranges, tomatoes, papaya, strawberries, guava, kiwi. (Dunkin MA, 2021; Ministry of Health, 2020). Vitamin C is a water-soluble vitamin and is a powerful antioxidant that has a positive effect on skin health and immune function. The body cannot produce or store vitamin C, so it is essential to take it regularly in sufficient quantities. The daily requirement of vitamin C is 90 mg. (Hill C, 2018)

Knowledge about foods rich in iron seems to increase after counseling. The average pre-test score was 57 and increased by 68 in the post-test. Iron primarily functions in the transport of oxygen to the hemoglobin of red blood cells but is also important for cell growth and immunity. (Spritzler F, 2020; Ministry of Health, 2020). Iron is an essential nutrient, so it must be obtained through the food consumed. The daily requirement of iron is 18 mg (Spritzler F, 2020). Foods that contain iron can come from animal and vegetable sources. Iron in foods of plant origin, in the process of digestion and absorption requires a supportive acid atmosphere such as vitamin C. Foods rich in iron include: shellfish, spinach, liver and other offal, legumes, red meat, pumpkin seeds, wheat germ, chicken, turkey, broccoli, tofu, dark chocolate, fish (Spritzler F, 2020; Ministry of Health, 2020).

Knowledge about food guide on plate seemed to increase. The mean pre-test score was 52 and increased by 68 in the post-test. The food plate must contain a nutritionally balanced diet, consisting of staple foods, vegetables, side dishes, and fruits. Side dishes should be cooked thoroughly, and limit the intake of sugar, salt and excess fat (Ministry of Health, 2020). The guidelines aim to ensure the fulfillment of balanced nutrition, which is basically an effort to balance the nutritional needs that are released with the intake of nutrients that are in. For normal adults, for example, filling a plate with rice (150 grams), vegetables (150 grams), fish dishes (75 grams), tofu (100 grams), and fruit (150 grams), and don't forget a glass of mineral water. (Permenkes No. 41, 2014).

Guidelines for balanced nutrition in the form of a Balanced Nutrition “Tumpeng” which consists of four pillars, namely: 1) Consuming a variety of foods, including a balanced proportion of food, in sufficient quantities, and not excessive. Currently, water consumption is also included in this pillar; 2) Get used to clean living behavior, to avoid infectious diseases that can affect a person's nutritional status; 3) Perform physical activity, to balance the expenditure and intake of nutrients, especially energy sources. Besides, physical activity also facilitates the body's metabolic system; 4) Monitor body weight regularly to maintain a normal weight (Permenkes No. 41, 2014).

## **CONCLUSION**

The education provided has been shown to have a positive impact on respondent's understanding of good nutrition to increase body immunity.

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## **CONFLICT OF INTEREST**

The authors declare that there is no conflict of interest in this work

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