Journal of Saintech Transfer Vol. 5, No. 2 2022| 102-109

JST

Journal of Saintech Transfer

Counselling and Training of Nutritional Snacks Making for Immunity Increasing During Covid 19 Pandemic

Ginta Siahaan[1]*, Mincu Manalu[1], Rumida[1], Riska S Ginting[1], Aprianti Manurung[1], Loika Sihombing[1], Faridah[1], and Ahmad R I Akmal[1]

[1]*Nutrition Department, Politeknik Kesehatan Kementerian Kesehatan Medan, Indonesia*

Abstract. Increasing body immunity is very necessary after the Covid-19 pandemic. One of the efforts that can be made to increase the body's immunity is to consume functional foods with immunostimulant activity, such as processed snakehead fish products in the form of nuggets, and "parkusel" juice made from a mixture of bitter melon, dates and celery. The purpose of community service is to provide knowledge and skills to housewives and the community at the Veteran ABRI Housing Complex in Medan Estate, Deli Serdang Regency, in making functional food products in the form of snakehead fish nuggets and Perkusel juice. The community service method used is the counseling method with leafet aids and training in making snakehead fish nuggets and perkusel juice. The results of the activity showed that there was an increase in the knowledge of the community participants in community service activities about nutritious snack products that can increase body immunity by 71% in the good value category.

Keyword: Covid-19, nuggets, snakehead fish, bitter melon, celery

Abstrak. *Peningkatan imunitas tubuh sangat diperlukan pasca pandemic Covid-19. Salah satu upaya yang dapat dilakukan untuk meningkatkan imunitas tubuh adalah dengan mengonsumsi pangan fungsional dengan aktivitas imunostimulan, seperti produk olahan dari ikan gabus dalam bentuk nuget, serta jus "parkusel" yang dibuat dari campuran pare, kurma dan seledri. Tujuan pengabdian masyarakat adalah memberi pengetahuan dan keterampilan kepada ibu-ibu rumah tangga dan masyarakat di Perumahan Veteran Purnawirawan ABRI di Medan Estate Kabupaten Deli Serdang dalam membuat produk pangan fungsional berupa nugget ikan gabus dan jus Perkusel. Metode pengabdian masyarakat yang digunakan adalah metode penyuluhan dengan alat bantu leafet dan pelatihan pembuatan nugget ikan gabus dan jus perkusel. Hasil kegiatan menunjukkan terjadi peningkatan pengetahuan masyarakat peserta kegiatan pengabdian masyarakat tentang produk snack bergizi yang dapat meningkatkan imunitas tubuh sebesar 71% dengan kategori nilai baik.*

Kata Kunci: *: Covid-19, Nugget, Ikan gabus, Pare, Kurma, Seledri*

Received [2 August 2022] | Revised [25 October 2022] | Accepted [17 November 2022]

1. Introduction

Coronavirus Disease (Covid-19) is an infection disease caused by a novel virus of Severe Acute Respiratory Syndrome Coronavirus (SARS-Cov2) and caused a deadly pandemic. Previous

*Corresponding author at: Nutrition Department, Politeknik Kesehatan Kementerian Kesehatan Medan, Indonesia

E-mail address: : ginzsiahaan@gmail.com

Journal Homepage: https://talenta.usu.ac.id/jst

research has shown that a higher mortality rate was found in elderly people especially those with comorbities such as diabetes, cardiovascular disease, hypertension, chronic kidney disease and other degenerative diseases have higher mortalities [1]. According to Pironi et al. [2], from 50% of covid-19 hospitalized patients, 70% of them were over 65 years old with malnutrition condition. Similar study conducted by Li et al [3] has reported that 52.7% of covid-19 hospitalized patients with the age of over 65 suffered from malnutrition, while 27.5% of them were diagnosed malnourishment. A similar result was reported by Haraj et al. [3] that 65.9% of covid-19 patients with an average age of 55 years are at risk of undernutrition and 14.6% are undernourished.

Several preventions of covid-19 have been carried out by Indonesia government, including wearing mask, maintaining distance, staying away from crowds, and reducing mobility [5]. Moreover, nutritional supplementation could also play a role in covid-19 patients. According to Calder [6] if an individual is infected, the activity of the immune system rises which is associated with an increase in metabolism rate, requiring more energy sources derived from the diet. Several vitamins (A, B6, B12, folate, C, D, and E), trace elements (Zn, Cu, Se, and Fe), and other essential nutrients including amino acids, and fatty acids have been shown to have important roles in supporting immune system and reducing an infection risk in human. However, the deficiency of these nutrients which seems to be connected to immune system disorders are more likely to occur on elderly people due to the aging process. This condition increases the chance of elderly people to get infected by COVID-19 with severe outcome. Therefore, providing adequate nutritional intake is very important in the elderly group [6].

To improve public health during the post-pandemic Covid-19 period, community service was carried out in the form of counseling and training in healthy food processing such as snacks. Healthy snacks made in this activity were snakehead fish nuggets and juice drinks made from a mixture of bitter melon, dates, and celery leaf ("Parkusel Juice"). The activity was carried out at "Veteran ABRI" Housing Complex in Medan Estate District Deli Serdang regency. The choice of location was based on the large number of elderly people in this housing area who are a group that is vulnerable to transmission of Covid-19.

The purpose of this community service activity is to socialize nutritious snacks products to the public especially to elderly group that can be used to increase body immunity after the Covid-19 pandemic.

2. Method

Community service was carried out at the "Veteran ABRI" Housing Complex in Medan Estate District, Deli Serdang Regency with the target of 20 people including housewives and other members of the community. This community service activity started with a pretest, the continued with training activities. At the end of the activity, a post-test was given to see the level of

understanding and skills of the target community in processing nutritious snack products that can boost the body's immune system during the Covid-19 pandemic.

2.1 The Training of Nutritious Snack Making

Community service activities was carried out in the form of counseling and demonstrations on making nutritious snacks in increasing body immunity after the Covid-19 pandemic. The counseling method used was public speaking using leaflets media, containing the meaning and benefits of nutritious snacks and procedures for making nutritious snack products in the form of snakehead fish nuggets and “parkusel” juice. Training activities included production of snakehead fish nuggets and “parkusel” juice which were attended by all participants. Participants also practiced making snakehead fish nuggets and “parkusel” juice themselves at home.

2.2 Activities Evaluation

Evaluation of activities is carried out through pre-tests and post-tests by giving questionnaires to all participants before and after the process of counseling and training activities. The purpose of this activity is to find out changes in the level of understanding of housewives regarding material about nutritious snacks that affect the body's immunity after the Covid-19 pandemic.

3. Results and Discussion

3.1 Counselling and Training on Making Snakehead Fish Nugget and “Parkusel” Juice

Counseling activities were held by distributing leaflets containing information about nutritious snacks, namely snakehead fish nuggets and “parkusel” juice, as well as the manufacturing process. During the delivery of material on nutritious snacks, it was conveyed about the nutritional composition of snakehead fish and its nuggets, bitter melon, dates, and celery as the material of "Parkusel" juice. In addition, the health benefits of snakehead fish nuggets and "Parkusel" juice was also informed to the community.

Snakehead fish (Channa strata) is one of the fish species that has more than 50% albumin fraction of protein [7]. This fish is abundant in Indonesia with a cheap price and easy to cultivate. The results of nutritional composition analysis on snakehead fish nuggets can be seen in Table 1.

Table 1. Nutrition composition of snakehead fish nugget per 100 g

No	Composition	Amount	Unit
1	Albumin	2.28	g
2	Carbohydrate	9.12	g
3	Fat	13.76	g
4	Protein	18.66	g
5	Ca	81.59	mg
6	Fe	2.59	mg
7	Zn	6.70	mg

The high albumin content of snakehead fish implied this fish has the potential to be used as a raw material for functional food such as fish nuggets [8]. Essential amino acids (EEA) are needed to boost the immune system [9]. EAA is used as fuel for protein synthesis and cell development and mostly obtained through the catabolism of energy substrates. EAA is also important for facilitating the intestinal microbiota in the digestive tract which is necessary for the immune system [10,11].It can be used to boost the immune system in fighting the Covid-19 virus, as well as other viruses including HIV and tuberculosis bacteria.

In this activity, 2 types of nuggets were made, namely snakehead fish nuggets without the addition of other ingredients, and snakehead fish nuggets with addition of egg white and red beans (Figure 1). Other than snakehead fish nuggets, the parkusel juice was also processed in this community service (Figure 2). The results of the evaluation of product acceptance showed that these products were favorable by the participants.

Figure 1. Snakehead fish nuggets (left) and snakehead fish nuggets with the addition of red beans and egg white (right)

"Parkusel" juice is a combination of bitter gourd, dates and celery which is rich in antioxidants, so it can boost the body's immune system, especially in dealing with the Covid-19 virus. Fruits and vegetables contain phytochemical components that have benefits for health, such as their antioxidants, anti-inflammatories and immunomodulators activities. The results of the analysis of the nutritional composition of parkusel juice can be seen in Table 2. Parkusel juice contains 8.6 mg Vitamin C and 2.8 g fiber per serving (200 ml), so it can be used as a source of vitamin C and food fiber for the body.

Figure 2. "Parkusel" Juice

Journal of Saintech Transfer Vol. 5, No. 2 2022 | 102-109

Table 2. Nutrition composition of Parkusel Juice per 200 ml

No	Composition	Amount	Unit
1	Karbohidrat	20.1	g
2	Protein	2.0	g
3	Lemak	0.5	g
4	Serat	2.8	g
5	Vitamin C	8.6	mg
6	Kalori	82.3	kcal

Bitter melon (Momordica charantia) is a type of vegetable that is also useful for preventing various types of diseases such as diabetes mellitus [12], ulcers [13], and inflammation [14]. The bioactive components contained in bitter melon are minerals, alkaloids, vitamins, steroid saponins, polypeptides, and essential oils [15].

Date palms are considered as a cheap and energy-rich food source due to its rich nutritional components such as carbohydrates (including soluble sugars), proteins, lipids and certain essential minerals and vitamins [16]. Moreover, dates have high polyphenols and functional dietary fiber contents which help maintain the digestive tract [17,18]. Polyphenols in dates also have antimutagenic, antioxidant, anticarcinogenic and anti-inflammatory bioactivity [19].

Celery (Apium graveolens) is widely consumed and cultivated throughout the world [20]. This plant can be used as a diuretic, for gland stimulation, bile, kidney stones, to regulate the intestines, to increase appetite, and as a prophylaxis for nervous agitation [21]. Other previous studies have also shown that celery has antimicrobial [22], antioxidant [23], cardioprotective [24], gastroprotective [25], hypolipidemic [26], cytotoxic [27], and anti-inflammatory [28] activities.

Dietary fibers have direct and indirect effects on human immune systems by modulating intestinal barriers function and immune response. The mechanism of fiber in influencing the immune cell is by activating the pattern recognition receptors (PRRSs) such as C-type lectin receptors (□-glucan), galectins, or Toll like receptors mainly TLR-2 and TLR-4, e.g., FOS and GOS) on epithelial cells and cells in innate immune system [29].

3.2 Activities Evaluation

All participants in this community service activity were given a pre-test prior to counseling and training on snack processing. After the delivery of the material, a question and answer session was conducted between the participants and presenters. This activity was followed by the post work by the participant. The results of the pre-test and post-test are shown in Table 3.

Table 3. Knowledge of community service participants before (pre-test) and after counseling (post-test)

Category	Pre-Test		Post Test	
	n	%	n	%
Good	6	29	15	71
Enough	8	38	4	19
Less	7	33	2	10

Based on the results of the questionnaire before counseling, there were 6 people (29.6%) who answered questions in the good category, while 7 people (38%) were considered to have lack knowledge of nutritious snacks that affect the body's immunity after the Covid-19 pandemic (poor category). The results of pre-test were changed after the counseling session which were proven by the increasing of post-test value. Based on the results of the post-test in the table, there were 15 people (71.4%) who were in the good category, showing an increase in the level of knowledge. The distribution of the sample based on knowledge in the sufficient category is 2 people (9.5%). The community service participants have increased their knowledge about the function of bitter gourd, dates, and celery for health. In addition, they were enthusiastic about processing snakehead fish, bitter melon, dates, and celery products into nutritious snacks.

4. Conclusion

Community service activities in the form of counseling and training on making healthy snack foods have been carried out at the Veteran ABRI Housing Complex in Medan City with 21 participants consisting of housewives and residents in the housing complex. Snakehead fish nuggets and "perkusel" juice made from bitter melon, dates and celery were successfully processed as healthy snacks. Snakehead fish nuggets and "perkusel juice" have a good nutritional composition and can be used as raw materials to increase the body's immunity. The results of the activity showed that there has been an increase in knowledge about the importance of nutritious food products to boost the immune system in the post-covid-19 pandemic. This has proven by the increase of post-test value of the participants, showing 15 people in good category (71%). It is hoped that similar activities can be carried out in other areas to improve the level of public health.

REFERENCES

[1] Pironi L, Sasdelli AS, Ravaioli F, Baracco B; Battaiola C, Bocedi G, Brodosi L, Leoni L, Mari GA; Musio A. "Malnutrition and nutritional therapy in patients with SARS-CoV-2 disease". *Clin. Nutr.* Vol. 40, pp.1330–1337. 2021.

[2] Li T, Zhang Y, Gong C, Wang J, Liu B, Shi L, Duan J. "Prevalence of malnutrition and analysis of related factors in elderly patients with COVID-19 in Wuhan, China". *Eur. J. Clin. Nutr.* Vol. 74, pp. 871–875. 2020.

[3] Haraj NE, El Aziz S, Chadli A, Dafir A, Mjabber A, Aissaoui O, Barrou L, Hamidi CEKE, Nsiri A, Al-Harrar R. "Nutritional status assessment in patients with Covid-19 after discharge from the intensive care unit". *Clin. Nutr. ESPEN*. Vol. 41, pp. 423–428. 2021.

[4] Chiu NC, Chi H, Tai YL, Peng CC, Tseng CY, Chen CC, Tan BF, Lin CY. "Impact of Wearing Masks, Hand Hygiene, and Social Distancing on Influenza, Enterovirus, and All-Cause Pneumonia During the Coronavirus Pandemic: Retrospective National Epidemiological Surveillance Study". *J Med Internet Res*. Vol. 22. No. 8. 2020.

[5] Ministry of Health Republic of Indonesia. Pedoman Pencegahan dan Pengendalian Corona Virus Diases (Covid-19) [Guidelines for Prevention and Control of Corona Virus Diases (Covid-19)] – In Bahasa Indonesia. 2020.

[6] Fauziyana N, Hardiany NS, Prafiantini E, "Diet Quality Profile among Urban Elderly in Jakarta during COVID-19 Pandemic in Indonesia." *Amerta Nutr.* Vol. 6, pp. 191–197. 2022.

[7] Rosyidi RM, Januarman J, Priyanto B, Islam AA, Hatta M, Bukhari A, "The Effect of Snakehead Fish (*Channa striata*) Extract Capsule to the Albumin Serum Level of Post-operative Neurosurgery Patients," *Biomed. Pharmacol. J*. Vol. 12, No. 2, pp. 893–899, 2019.

[8] Permatasari TAE, Ernirita, Kurniaty I, Widakdo G. "Nutritional and microbiological characteristics of snakehead fish flour (*Channa striata*) and its modification as weight enhancing supplements for children with tuberculosis." *Food Science and Technology*. Vol. 9, No. 3, No. 45-57. 2021.

[9] Grobler L, Durao S, Van der Merwe SM, Wessels J, Naude CE. "Nutritional supplements for people being treated for active tuberculosis: A technical summary." *S Afr Med J*. Vol. 108, No. 1, No. 16–18. 2017.

[10] Grohmann U, Mondanelli G, Belladonna ML, Orabona C, Pallotta MT, Iacono A, Puccetti P, Volpi C. "Amino-acid sensing and degrading pathways in immune regulation." *Cytokine Growth Factor Rev.* Vol. 35, pp. 37-45. 2017.

[11] Bifari F, Ruocco C, Decimo I, Fumagalli G, Valerio A, Nisoli E. "Amino acid supplements and metabolic health: a potential interplay between intestinal microbiota and systems control." *Genes Nutr*. Vol. 12, No. 1, pp. 1-12 2017.

[12] Giovannini P, Howes MJ, Edwards SE. "Medicinal Plants Used in the Traditional Management of Diabetes and Its Sequelae in Central America: A review." *Journal of Ethnopharmacology*. Vol. 184, pp. 58–71. 2016,

[13] Alam S, Asad M, Asdaq SM, Prasad VS. "Antiulcer Activity of Methanolic Extract of Momordica Charantia L. In Rats." *Journal of Ethnopharmacology*. Vol. 123, No. 3, pp. 464–469. 2009,

[14] Dandawate PR, Subramaniam D, Padhye SB, Anant S, "Bitter Melon: A Panacea for Inflammation and Cancer." *Chinese Journal of Natural Medicine*. Vol. 14, No. 2, pp. 81–100. 2016.

[15] Anilakumar KR, Kumar GP, Ilaiyaraja N. "Nutritional, Pharmacological and Medicinal Properties of Momordica Charantia." *International Journal of Food Science and Nutrition.* Vol. 4, No. 1, pp. 75–83. 2015.

[16] Khalid S, Khalid N, Khan RS. "A review on chemistry and pharmacology of Ajwa date fruit and pit." *Trends Food Sci Techno*. Vol. 63, pp. 60–69. 2017.

[17] Al-Farsi M, Alasalvar C, Morris A. "Comparison of antioxidant activity, anthocyanins, carotenoids, and phenolics of three native fresh and sun-dried date (*Phoenix dactylifera* L.) varieties grown in Oman." *J Agric Food Chem.* Vol. 53, pp. 7592–7599. 2005.

[18] Habib HM, Platat C, Meudec E. "Polyphenolic compounds in date fruit seed (Phoenix dactylifera): characterisation and quantification by using UPLC-DAD-ESI-MS." *J Sci Food Agric.* Vol. 94, pp. 1084–1089. 2014.

[19] Maqsood S, Adiamo O, Ahmad M. "Bioactive compounds from date fruit and seed as potential nutraceutical and functional food ingredients." *Food Chem* Vol. 308. 2020.

[20] Choochote W, Tuetun B, Kanjanapothi D, Rattanachanpichai E, Chaithong U, Chaiwong P, Pitasawat B. "Potential of crude seed extract of celery, *Apium graveolens* L., against the mosquito *Aedes aegypti* (L.)(*Diptera: Culicidae*)." *Journal of Vector Ecology*. Vol. 29, No. 2, pp. 340-346. 2004.

[21] Al-Snafi AE. "The Pharmacology of Apium graveolens- A Review. International." *Journal for Pharmaceutical Research Scholars.* Vol. 3, No. 1, pp. 671-677. 2014.

[22] Genatrika E, Satriani F, Hapsari. "Antibacterial Activity of Celery Leaves (*Apium graveolens* L.) Formulated in Toothpaste Against *Streptococcus mutans*." *International Journal of Applied Pharmaceutics*. Vol. 11, No. 5, pp. 14-16. 2019.

[23] Sameh B, Ibtissem B, Mahmoud A, Boukef K, Boughattas NA. "Antioxidant Activity of *Apium graveolens* Extracts." *Journal of Biologically Active Products from Nature*. Vol. 1, No. 5-6, pp. 340-343. 2011.

[24] Rumiyati, Hakim AR, Winarti AD, Septia DN. "Antihypertensive testing of Combination of *Apium graveolans* L., *Orthosiphon stamineus* Benth., and *Morinda citrifolia* L. extract on Normotensive and Hypertensive *Sprague Dawley* Rats." *Traditional Medicine Journal*. Vol. 21, No. 3, pp. 149-156. 2016.

[25] Al-Howiriny T, Alsheikh A, Alqasoumi S, Al-Yahya M, El-Tahir K, Rafatullah S. "Gastric antiulcer, antisecretory, and cytoprotective properties of celery (Apium graveolens) in rats." *Pharmaceutical Biology*. Vol. 48, No. 7, pp. 786-793. 2010.

[26] Aburjai T, Mansi K, Abushoffa A, Disi AM. "Hypolipidemic Effects of Seed Extract of Celery (Apium graveolens) in Rats." *Pharmacognosy Magazine.* Vol. 5, No. 20, pp. 301-305. 2009.

[27] Subhadradevi V, Khairunissa K, Asokkumar K, Umamaheswari M, Sivashanmugam A, Jagannath P. "Induction of Apoptosis and Cytotoxic Activities of *Apium graveolens* Linn. Using in vitro Models." *Middle East Journal of Scientific Research*. Vol. 9, No. 1, pp. 90-94. 2011.

[28] Lewis DA, Tharib SM, Veitch GBA. "The antiinflammatory activity of celery *Apium graveolens* L. (Fam. Umbelliferae)." *Pharmaceutical Biology*. Vol. 23, No. 1, pp. 27-32. 1985.

[29] Venter C, Meyer RW, Greenhawt M, Pali-Schöll I, Nwaru B, Roduit C, Untersmayr E, Adel-Patient K, Agache I, Agostoni C, Akdis CA, Feeney M, Hoffmann-Sommergruber K, Lunjani N, Grimshaw K, Reese I, Smith PK, Sokolowska M, Vassilopoulou W, Vlieg-Boerstra B, Amara A, Walter J, O'Mahony L. "Role of dietary fiber in prmoting immune health" – An EAACI position paper. *Allergy*. Vol. 77, No. 11, pp. 3185-3198. 2022.