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FOOD SUPPLEMENT CONSUMPTION DOES NOT RELATED TO SELF-REPORTED SYMPTOPMS OF COVID-19 AMONG STUDENTS IN BINAWAN UNIVERSITY

(Konsumsi suplemen tidak berhubungan dengan pelaporan gejala Covid-19 pada mahasiswa Universitas Binawan)

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ABSTRACT

The consumption of food supplements is considered an influential factor to increase the immune system in preventing COVID-19. However, no studies have confirmed the relationship between them. This study aims to analyse the association between multivitamin supplement intake and the appearance of COVID-19 symptoms trough a self-report. The method of this study was an analytic survey with a cross-sectional design. The survey was conducted in two stages toward students from Binawan University, Jakarta. The number of respondents involved in this study were 403 respondents in the first stage, and 127 in the second stage in this study. The data collection included the consumption of supplements, the appearance of COVID-19 symptoms, and the ability to do physical activity. The statistical analyses were Chi-square and Fischer exact test. Results showed that 67,7% of respondents consumed supplements. The type of supplement was vitamin C (51,2%) and another type of multivitamin was (20,1%). There was no significant association found between the consumption of supplements and the appearance of symptoms of COVID-19 and respondents' ability to perform physical activity (p> 0,05). Conclusion, supplements are not the only factor preventing COVID-19. Consuming a diverse diet in sufficient quantities, maintaining physical fitness, and performing 3 M (maintaining a social distancing, wearing masks, and performed handwashing) could be other potential factors.

***Kata Kunci**: COVID-19, immunity, supplement*

ABSTRAK

Konsumsi suplemen makanan dinilai dapat meningkatkan sistem imun untuk mencegah COVID-19. Namun, hal tersebut belum ada hasil penelitian yang menkonfirmasi hubungan antara keduanya. Tujuan penelitian untuk mengetahui hubungan asupan suplemen multivitamin terhadap munculnya gejala COVID-19. Metode penelitian yaitu survey analitik dengan desain potong lintang. Survey dilakukan dalam dua tahap terhadap mahasiswa Universitas Binawan, Jakarta, Indonesia. Jumlah responden yang terlibat pada penelitian ini adalah 403 responden pada tahap pertama, dan 127 pada tahap kedua dalam penelitian ini. Data yang dikumpulkan antara lain konsumsi suplemen, kemunculan gejala covid, dan kemampuan melakukan aktivitas fisik. Uji statistik yang digunakan adalah Chi-square dan Fischer exact test. Hasil menunjukkan sebesar 67,7% pernah mengkonsumsi suplemen. Jenis suplemen yang dikonsumsi yaitu vitamin C (51,2%), dan multivitamin kombinasi (20,1%). Tidak terdapat hubungan antara konsumsi suplemen dan kemunculan gejala COVID-19, begitu pula hubungannya dengan kemampuan responden untuk melakukan aktivitas fisik (p> 0,05). Kesimpulan, suplemen bukan satu-satunya faktor pencegah COVID-19. Konsumsi makanan yang beragam dengan jumlah yang cukup, menjaga kebugaran tubuh dan melakukan 3 M (menjaga jarak, menggunakan masker dan mencuci tangan) dapat menjadi faktor pendukung lainnya.

***Keywords:** COVID-19, imunitas, suplemen*

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INTRODUCTION

SARS-Cov 2 that causes an acute respiratory infection called Corona Virus disease (COVID-19) has spread worldwide. Since its first identification in China, the virus has affected severely the developing countries, including Indonesia.[1] According to the latest update in May, 2020 from World Health Organization (WHO), the total infected cases worldwide were 5.596.550 cases with a total of 353.373 deaths from 216 countries.[2] The first confirmed COVID-19 case in Indonesia was on March 2, 2020. Even though the small number of cases found in the beginning, within 3 months it has increased sharply up to 24.538 cases with a total of 1.496 deaths (6,1% of the number of positive cases). Among them, most cases have mainly occurred in densely populated areas such as DKI Jakarta (28,9%), East Java (17,4%), and West Java (9%).[3]

Easily transmitted from human to human through droplets from an infected individual who exhales, sneezes, and coughs made Coronavirus has the highest transmission rate.[4,5] Moreover, the droplets from infected people that remain viable on various surfaces of objects could be the other route of transmission by contaminating other's people hands. Spontaneously touch the nose and mouth without washing their hands after touching them increases the possibility of infection.[6]

In general, the incubation period for this disease is 14 days (2 weeks).[1] The natural history of this disease varied for each person, depends on their immunity. The infected persons might have shown a symptom or might be asymptomatic. Symptoms that occur in infected people are similar to common cold and influenza, such as nasal congestion, olfactory abnormalities, pharyngodynia.[7] According to the report from Huang et al.[8], and Chan et al.[4], most of the admitted COVID-19 patients at the hospital showed mild symptoms, while only 20% of those showed severe or critical symptoms.

Increasing individual immunity is an effective way to prevent the infection of COVID-19. In order to do that, having a vaccination is the most ideal way. However, a clear precaution for this disease by using vaccines has not been discovered. Therefore, consuming adequate nutrient intake, sufficient exercise, and additional intake of multivitamin and mineral supplements or other immune boosters was suggested. Past evidence showed some vitamins and minerals have been proofed increasing immunity and prevent virus infections, i.e. vitamins A, C, D, E, zinc, selenium, and copper.[9] Further, in other studies, the consumption of herbal medicines and probiotics could also prevent virus infections.[10] However, the association of the consumption of food supplements withthe COVID-19 disease still remains unclear.

WHO and the Indonesian Government in Presidential Decree No. 11 of 2020 had declared this condition as a pandemic and a National disaster.[3] Thus, the Indonesian government implements a Large-Scale Social Restrictions policy set out in Presidential Decree No 21 of 2020 to restrict the movement of people to enter and out of the region. This regulation also requires the local governments to establish a restriction for an education and business activities, with performing a home-based learning and Work-From-Home (WFH) program. Unfortunately, some people did not or could not really obey the rules due to economic demands to generate income for family or students who still have to run learning activities at school.[11] Therefore, consuming food supplement suddenly become crucial for many people. This made many people bought more supplements and causing product scarcity. Even it was available but with a non-reasonable expensive price. This caused the people who urgently need this supplement could not access the product.

The vulnerable group to the viruses is people in a crowd, public transportation users, for instance, students. Therefore, this study aimed to determine the association between consumption of multivitamin and/or mineral supplements on the appearance of COVID-19 symptoms among students in the Binawan University Jakarta.

METHOD

This research was a cross-sectional study with a random sampling method. The online survey using google form was conducted in April 2020 at Binawan University, Jakarta. The questionnaires using Google Form were distributed to subjects (Binawan students). The total population of Binawan Student was 3.576.

Therefore, based on the calculation of the sample size with 95% CI, an estimation of 50% population, error 5%, and potential sample losses 20%, our sample size that was 403 represents the study population.

We distributed the questionnaires twice, the first questionnaire was to determine the consumption habits of supplements and the appearance of COVID-19 symptoms (an increase in body temperature especially in the chest or on the back, disruption of breathing bar/cough that was new continuously or repeatedly). The second questionnaire was delivered to respondents who consumed multivitamin and/or mineral supplements, to find out more specifically the type of supplement consumed, gender, their nutritional status. The total respondents were 403 respondents in the first stage, and 127 respondents in the second stage (Diagram 1).

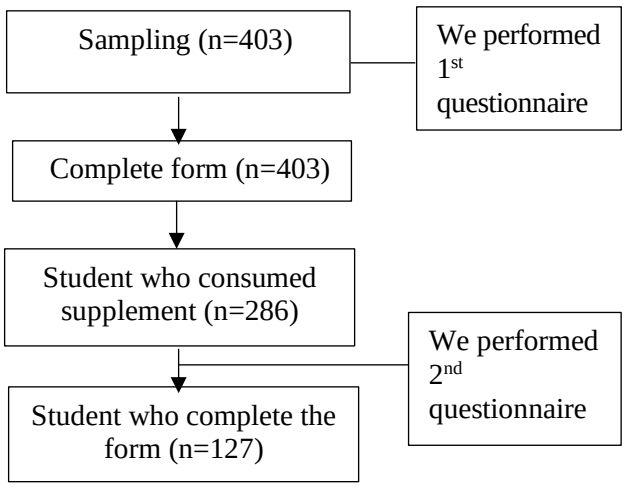


Diagram 1. Flow of study participants

All statistical analyses were performed using SPSS version 16. Data related to respondent characteristics such as gender, major, year of entry, consumption of supplements, and symptoms of COVID 19 were analysed using univariate tests. While the association of supplement consumption and the appearance of COVID-19 symptoms was analysed using the Pearson Chi-Square test. The association of supplement consumption and condition to do the daily activity on the respondent who has COVID-19 symptoms were analysed by Fischer exact test. The confidence interval for this research was 95%.

RESULT AND DISCUSSION

Table 1 showed the characteristics of study participants. The proportion of female and male student was 86,8% and 13,2 % respectively. Most of the participants were related to health such as nursing and midwifery (40,2%) and public health (32,3%). Meanwhile, students from other study programs involved in this study were limited. Younger students rather than final year students had more involvement in the online survey.

Table 1. Characteristic of subject

Characteristic	n	%
Sex		
Male	53	13,2
Female	350	86,8
Faculty of		
Business Economics	5	1,2
Physiotherapy	53	13,2
Social & Humanities	6	1,5
Nursing and Midwifery	162	40,2
Public Health	130	32,3
Science & Technology	47	11,7
Entry year		
2016	21	5,3
2017	101	25,3
2018	113	28,3
2019	165	41,3
Consume supplement		
Yes	273	67,7
No	130	32,3
Supplement consumption by gender		
Male	34	8,4
Female	273	67,7
Do you have COVID-19 symptoms		
Yes	21	5,2
No	382	94,8

The tendency of supplement consumption was high (67,7%) while the report for COVID-19 symptom was low (5,2%). Female students were more likely to consume supplements than male students. However, the result from the chi-square test showed that no significant correlation between supplement consumption and the appearance of the COVID-19 symptom (Table 2).

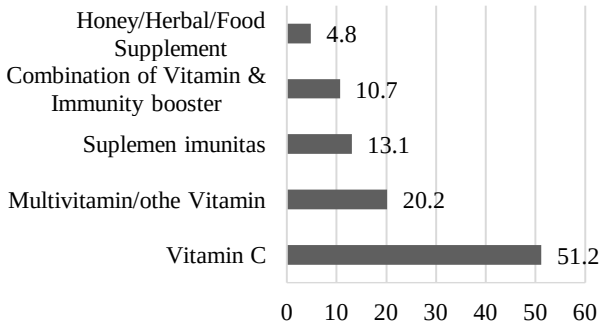
Table 2. Correlation of supplement consumption and appearance of the COVID-19 symptoms

Supplement consumption	Appearance of COVID-19 symptoms						OR, CI: 95% (Lower – Upper)	p-value
	Yes		No		Total			
	n	%	n	%	n	%		
Yes	15	5,5	258	94,5	273	100,0	1,201	0,710
No	6	4,6	124	95,4	130	100,0	0,455 – 3,172	
Total	21	5,2	382	94,8	403	100,0		

Further, as supplement consumption was assumed to influence the ability to perform a normal daily activity, this study assessed the relationship between them. The statistical analysis was conducted on 21 respondents who gave their responses to the following question, "Could you easily perform normal daily activities?". The result indicated that supplement consumption did not influence the ability to perform a daily activity (Table 3).

Table 3. The relationship between supplement consumption and conditions in carrying out daily activities

Supplement consumption	Condition in carrying out daily activity						OR, CI: 95% (Lower – Upper)	p-value
	Good		Poor		Total			
	n	%	n	%	n	%		
Yes	13	86,7	2	13,3	15	100,0	1,3	1,000
No	5	83,3	1	16,7	6	100,0	0,095 – 17,726	
Total	18	85,7	3	14,3	21	100,0		



Picture 2. Distribution of types of supplements consumed by respondents (n = 127)

Figure 2 showed the distribution of the type of supplements consumed by study participants. More than half of them consumed vitamin C (51,2%). While few of them consumed other types of supplements such as multivitamins (20,2%), immunity supplements (13,1%), a combination of vitamins and immunity supplements (10,7%), and honey/herbal/food supplements 4,8%. They believe that a supplement that is good for the body's immune system is VItamin C to protect itself from Covid-19

Table 4. Types of supplements consumed, benefits of supplements, and frequency of consumption (n= 127)

Questions	n	%
The benefits after consuming supplements		
Yes	120	94,0
No	7	6,0
Frequency of consume supplement		
1-3x/week	70	55,1
4-5x/week	18	14,2
>5x/week	39	30,7

Table 4 showed the detail information regarding the effect of supplement consumption and frequency of supplement intake. The questions were "Do you feel the benefits after consuming supplements?" and "How many times do you usually consume supplements?". The results showed that 94% reported to feel the benefits of supplement consumption, and only 6% did not feel the benefits. Most of respondents

took supplements 1-3 times /week (54,8%), while the rest of them 4-5 times/week (14,3%), and more than 5 times a week (31%).

COVID-19 has harmed millions of people all around the world, and WHO declares this condition as a pandemic.[2] There are two things to prevent this disease, external prevention, and internal prevention. External prevention includes wearing masks, washing hands with soap, keeping a distance, stay at home, using hand sanitizers, and cleaning the environment. Internal prevention could be done by increase our immunity.[12] The factors affecting immunity are age, gender, environment, heritable and non-heritable factor[13], nutrient intake.[14] Vitamin that has strong evidence against viruses are vitamin C and D, and zinc is the strong mineral to increase immunity[15], but it's also related to the dosage.

In the case of fighting coronavirus (SARS-Cov-2), people scared to get infected, and they try to increase the consumption of supplements especially multivitamins and the other immune booster. It makes those supplements were hard to find, also the price becomes more expensive. Apparently, in this study, we found that there was no significant correlation between the consumption of supplements with the appearance of COVID-19 symptoms. Also, when we tried to find the correlation of consumption supplement on the respondent who has COVID-19 symptoms and the condition to do their daily activity, we failed to find its correlation. Subjects with the good condition can do daily activities normally. This showed that they have a better immune response. Strong immune response during incubation and non-several stage can eliminate the virus and to prevent disease progression to severe stages.[16]

It could be due to the distribution gender of the respondents, in this research most of the respondents were women. Based on the findings of epidemiologists in China, it turns out that the impact of COVID-19 is 1.64 times more severe in men than in women.[17,18]

Since this virus binds the target on many epithelial cells in the lung that can express angiotensin-converting enzyme 2 (ACE 2), and this ACE 2 is on the X chromosome has an allele that resistance to the virus 24.[19,20]

Although some vitamins and minerals are proven to increase immunity, it is also important to pay attention to the frequency and dosage consumed. In our research, most of the respondents consumed the supplement only 1-3x/week. It might explain the reason why in this study supplement consumption was not related to the appearance of COVID-19 symptoms.

This finding only applies to one community of the same age (Binawan University student), it cannot be applied to different communities, especially in older people. Despite this study, we couldn't find the relationship between the consumption of supplements with COVID-19 symptoms, however, maintaining nutritional intake in various ways is still recommended to maintain our health.

CONCLUSION

Supplement consumption has no correlation with the appearance of COVID-19 symptoms, especially on Binawan University students. Besides, there was no relationship between consuming a supplement with the condition of doing a daily activity on the respondent who had COVID-19 symptoms.

Suggestion, the purpose of supplement consumption is to meet the optimal micronutrient requirement of an individual, especially for those with deficiencies. However, it should be underlined that the consumption of a balanced diet remains the main key factor in supporting the immune system.

REFERENCES

1. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, Ren R, Leung KSM, Lau EHY, Wong JY, Xing X, Xiang N, Wu Y, Li C, Chen Q, Li D, Liu T, Zhao J, Liu M, Tu W, Chen C, Jin L, Yang R, Wang Q, Zhou S, Wang R, Liu H, Luo Y, Liu Y, Shao G, Li H, Tao Z, Yang Y, Deng Z, Liu B, Ma Z, Zhang Y, Shi G, Lam TTY, Wu JT, Gao GF, Cowling BJ, Yang B, Leung GM, Feng Z. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia. *New England Journal of Medicine*.

2020;382(13):1199-1207. doi:10.1056/NEJMoa2001316.
2. World Health Organization. Coronavirus disease (COVID-19) situation dashboard. World Health Organization. https://www.who.int/emergencies/diseases/novel-coronavirus-2019. Published 2020. Accessed May 29, 2020.
3. MoH RI. Information on Emerging Infection Ministry of Health RI. Ministry of Health, Indonesia. https://covid19.kemkes.go.id. Published 2020. Accessed May 29, 2020.
4. Chan JF-W, Yuan S, Kok K-H, To KK-W, Chu H, Yang J, Xing F, Liu J, Yip CC-Y, Poon RW-S, Tsoi H-W, Lo SK-F, Chan K-H, Poon VK-M, Chan W-M, Ip JD, Cai J-P, Cheng VC-C, Chen H, Hui CK-M, Yuen K-Y. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *The Lancet*. 2020;395(10223):514-523. doi:https://doi.org/10.1016/S0140-6736(20)30154-9.
5. Pascarella G, Strumia A, Piliego C, Bruno F, Del Buono R, Costa F, Scarlata S, Agrò FE. COVID-19 diagnosis and management: a comprehensive review. *Journal of Internal Medicine*. 2020;288(2):192-206. doi:10.1111/joim.13091.
6. van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, Tamin A, Harcourt JL, Thornburg NJ, Gerber SI, Lloyd-Smith JO, de Wit E, Munster VJ. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. *New England Journal of Medicine*. 2020;382(16):1564-1567. doi:10.1056/NEJMc2004973.
7. Lovato A, de Filippis C. Clinical presentation of COVID-19: a systematic review focusing on upper airway symptoms. *Ear, Nose & Throat Journal*. 2020;99(9):569-576. doi:https://doi.org/10.1177/0145561320920762.
8. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X, Cheng Z, Yu T, Xia J, Wei Y, Wu W, Xie X, Yin W, Li H, Liu M, Xiao Y, Gao H, Guo L, Xie J, Wang G, Jiang R, Gao Z, Jin Q, Wang J, Cao B. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*. 2020;395(10223):497-506. doi:https://doi.org/10.1016/S0140-6736(20)30183-5.
9. Iovino L, Mazziotta F, Carulli G, Guerrini F, Morganti R, Mazzotti V, Maggi F, Macera L, Orciuolo E, Buda G, Benedetti E, Caracciolo F, Galimberti S, Pistello M, Petrini M. High-dose zinc oral supplementation after stem cell transplantation causes an increase of TRECs and CD4+ naïve lymphocytes and prevents TTV reactivation. *Leukemia Research*. 2018;70:20-24. doi:https://doi.org/10.1016/j.leukres.2018.04.016.
10. Mousa HA-L. Prevention and treatment of influenza, influenza-like illness, and common cold by herbal, complementary, and natural therapies. *Journal of evidence-based complementary & alternative medicine*. 2017;22(1):166-174. doi:https://doi.org/10.1177/2156587216641831.
11. Presidential Decree of Indonesia. Presidential Decree No 21 of 2020. Indonesian government implements a Large-Scale Social Restrictions. 2020.
12. Tay MZ, Poh CM, Rénia L, MacAry PA, Ng LFP. The trinity of COVID-19: immunity, inflammation and intervention. *Nature Reviews Immunology*. 2020;20(6):363-374. doi:10.1038/s41577-020-0311-8.
13. Afridi S. Individual immune system responds differently. *Immunology Case Reports*. 2017;1(1):5-10. doi:10.35841/immunology-case-reports.1.1.5-10.
14. Childs CE, Calder PC, Miles EA. Diet and Immune Function. *Nutrients*. 2019;11(8):1-14. doi:10.3390/nu11081933.
15. Gombart AF, Pierre A, Maggini S. A Review of Micronutrients and the Immune System–Working in Harmony to Reduce the Risk of Infection. *Nutrients*. 2020;12(1):1-41. doi:10.3390/nu12010236.
16. Shi Y, Wang Y, Shao C, Huang J, Gan J,

Huang X, Bucci E, Piacentini M, Ippolito G, Melino G. COVID-19 infection: the perspectives on immune responses. *Cell Death & Differentiation*. 2020;27(5):1451-1454. doi:10.1038/s41418-020-0530-3.

17. Epidemiology Working Group for NCIP Epidemic Response Chinese Center for Disease Control and Prevention. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China. [articel in chinese]. *Zhonghua Liu Xing Bing Xue Za Zhi*. 2020;2(41):145-151. doi:10.3760/cma.j.issn.0254-6450.2020.02.003.
18. Taneja V. Sex Hormones Determine Immune Response. *Frontiers in Immunology*. 2018;9:1931. doi:https://doi.org/10.3389/fimmu.2018.01931.
19. Jia HP, Look DC, Shi L, Hickey M, Pewe L, Netland J, Farzan M, Wohlford-Lenane C, Perlman S, McCray PB. ACE2 receptor expression and severe acute respiratory syndrome Coronavirus infection depend on differentiation of human airway epithelia. *Journal of Virology*. 2005;79(23):14614 LP - 14621. doi:10.1128/JVI.79.23.14614-14621.2005.
20. Xu H, Zhong L, Deng J, Peng J, Dan H, Zeng X, Li T, Chen Q. High expression of ACE2 receptor of 2019-nCoV on the epithelial cells of oral mucosa. *International Journal of Oral Science*. 2020;12(1):8. doi:10.1038/s41368-020-0074-x.