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ORIGINAL ARTICLE

# THE USE OF VITAMIN SUPPLEMENTS AND HERBAL MEDICINES AMONG MEMBERS OF ELDERLY POSYANDU DURING THE COVID-19 PANDEMIC IN NORTH JAKARTA

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***Abstract. Background:*** *During the COVID-19 pandemic, the elderly have been identified as a particularly vulnerable group. The use of vitamin supplements and herbal medicines to enhance immunity has been a measure to prevent the development of COVID-19.* ***Purpose:*** *This study was performed to identify the use of supplemental vitamins and herbal medicines including analyzing the benefit of using them among the elderly who participated in the "Mawar" Elderly Posyandu (integrated health post) in North Jakarta, Indonesia, during the pandemic.* ***Materials and methods:*** *This was a descriptive study with a cross-sectional design. The target population for the study were active participants of "Mawar" Elderly Posyandu aged at least 60 years old.* ***Results:*** *Although the majority of respondents only had an elementary and high school education as their highest educational attainment, they had good enough knowledge about COVID-19. During the pandemic, 81 and 79 out of 85 respondents consumed vitamin supplements and herbal medicines, respectively. Vitamin C and ginger were the most widely used vitamin supplement and herbal product. There were 55.56% and 35.44% of respondents who felt better after consuming supplements and herbal products for one week.* ***Conclusion:*** *This study recommends that government should support the revitalization of elderly Posyandu as it may improve the awareness of the community to maintain their health.*

***Key words:*** *COVID-19, vitamins, supplements, traditional herbal medicines, Posyandu*

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## INTRODUCTION

Corona Virus Disease 2019 (COVID-19) has become a global pandemic. In Indonesia, confirmed cases of COVID-19 were estimated to have reached 6,040,432 with a mortality rate reaching 2,60% [1]. The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infects the alveoli in the lungs and enterocytes because those cells have angiotensin-converting enzyme 2 (ACE2) which is the receptor for SARS-CoV-2. This receptor is used by another type of SARS virus which previously made an outbreak in China almost two decades ago [2]. Infection of SARS-CoV-2 in humans causes acute respiratory problems including fever, cough, and difficulty to breath. The symptom may appear within 2-14 days after the viral exposure [3].

COVID-19 infects all age groups, but the elderly population belongs to the relatively more susceptible ones [4], with a higher risk of transmission and mortality compared to the younger age groups [5]. The mortality rate was much higher among the el-

derly compared to younger age groups [6]. Older age, certain comorbidities and taking ACE2 inhibitors were considered risk factors for one individual to get infected and to develop severe symptoms [7]. The elderly can be defined as people aged 60 years old and over [8]. In Indonesia, the mortality rate of the elderly population due to COVID-19 reached 46.8% in 2022, based on national data officially published by the government (https://covid19.go.id/). The susceptibility of the elderly should be anticipated since the aging process involves molecular and cellular mechanisms in the context of various organ systems. It has been established that in the crucial process of aging, a range of structural and functional transformations, as well as immune function, manifests into a decreased ability in fighting infection [9].

The COVID-19 pandemic has presented us with an opportunity to reevaluate past approaches and to develop new strategies for combating global pandemics [10]. One such strategy that has gained increasing attention during this crisis is the use of complementary and alternative medicine (CAM) as an immune booster. CAM usage, including vitamin supplements and herbal medicines intake, had significantly increased during the COVID-19 pandemic. Even in developed countries, around 80% of the population still uses herbal medicines without being controlled [11]. Alternative therapy tends to promote health-seeking behavior, and obtaining health information on social media tends to increase the frequency of visiting primary healthcare [12]. Almost all participants of an Indonesian study reported that they frequently consumed a lot of vitamins and fruit to maintain their nutritional balance [13]. Another study reported that the most common herbal medicines consumed by students in a health polytechnic in Jakarta were jamu [14]. The National Agency Drug and Food Control (NA-DFC) of Indonesia officially categorizes Indonesian traditional medicines into jamu, standardized herbal medicines, and phytopharmaceuticals. Jamu does not need standardized raw material for its production and it only needs empirical evidence for its use and labelling [15].

Believed to be able to improve immunity, the use of plant-based natural products as health supplements as well as alternative medicines has been a part of Indonesian culture. Accumulated data suggest that secondary metabolites from various plants have potential benefits as immunomodulators. Some phytochemicals, including those from plants used as traditional medicines in Indonesia, are thought to have antiviral activity against SARS-CoV-2 [16]. The bitter plant (*Andrographis paniculata* (Burm.f)), meniran (*Phyllanthus niruri* L), turmeric (*Curcuma longa* L), temulawak (*Curcuma xanthorrhiza*), ginger (*Zingiber officinale*), and guava (*Psidium guajava*) are among the most common plants used as alternative medicines in the country which are also recognized by the NA-DFC as having empirical and scientific proof to possess health benefits [15].

To prevent the transmission of COVID-19, some new habits are necessary to implement, especially wearing masks, washing hands frequently, and maintaining a physical distance. In addition to these health protocols, a healthy lifestyle in general also needs to be maintained, including adequate nutritional intake. A recent review mentioned that a balanced diet can help maintain the immune system which is essential to fighting viral infections. Elective micronutrient supplementation including vitamins can be useful, especially for those who are more susceptible to infection, such as the elderly [17].

Special attention needs to be given to control health problems for the elderly in Indonesia considering the number of elderly people in this country is increasing progressively [18]. One form of health services provided by the Indonesian government for the elderly group is through the Integrated Health Post (Posyandu) for the elderly, which is a form of integrated basic health services for the elderly at the village level in each of the local health community centers [19]. The objective of this research was to identify the use of supplemental vitamins and traditional medicines by the elderly in the era of the COVID-19 pandemic at an elderly Posyandu in North Jakarta, Indonesia.

## MATERIALS AND METHODS

This is a descriptive study with a cross-sectional study design. Data were collected during the period from September 2021 until January 2022 in “Mawar” Elderly Posyandu (integrated health post), North Jakarta, Indonesia. The sampling location was determined purposively considering the criteria that the selected Posyandu should have at least 100 people as active members, have routine activity, and be easily accessible despite the COVID-19 pandemic. The study population included members of the Elderly Posyandu Mawar aged 60 years old and over, which were 101 people in total. Inclusion criteria were elderly being active members, indicated by participation in Posyandu activities at least once a month. Those who refused to be interviewed and could not communicate due to disability were excluded from this study. As a result, there were 85 participants in the study.

Data were collected through interviews using a structured questionnaire. Before the interview, respondents were asked for their consent to be involved as research participants, under the provisions contained in the ethical approval from Syarif Hidayatullah State Islamic University (UIN Syarif Hidayatullah) Jakarta No. Un.01/F.10/KP.01.1/KE.Sp/09.08.002/2021 dated September 2, 2021.

Before the data collection process, a questionnaire trial was conducted on 10 elderly people who were acquaintances of the researchers. After that, the questionnaire was corrected and adjusted accordingly to the input of the trial. Dependent variables in this study were level of education, job category, and knowledge about COVID-19 and the immune system. Dependent variables included the use of vitamin supplements and the use of herbal/traditional medicines. The collected data was analyzed using SPSS ver. 24 by univariate and bivariate statistics.

## RESULTS

A total of 85 elderly participants responded to the questionnaire. The majority (69.41%) of them belonged to the age group of younger than 70 years old. The proportion of female respondents was slightly higher than the male respondents. All of the respondents have been married. Over half of the respondents (51.75%) had finished high school as their highest level of education. Only less than 10% of the respondents pursued higher education. Meanwhile, the most common job category was housewives (37.65%) followed by unemployed/retired (28.24%).

More than half of our respondents understood the general definition of COVID-19 (77.65%) and the common symptoms (90.59%). Most of them agreed that the virus can be transmitted with direct contact and cough spray from an infected person (77.65%). Almost 87.10% of the respondents admitted that they obtained information about COVID-19 from more than one source. When given a multiple-choice question about the definition of immunity, the most oftenly chosen answer (35.29%) was “The body’s ability to fight pathogenic organisms”. A large majority of the respondents agreed that health protocols need to be applied in various settings during this pandemic. Additionally, 90.59% of them understood consuming nutritious foods as another important habit to improve immunity (Table 1).

We found that 81 out of the 85 respondents consumed micronutrient supplements during the COVID-19 pandemic. The most common sources of vitamin supplements were pharmacies (72.84%) and other health care facilities. Vitamin C was the most widely consumed supplement among our subjects. However, more subjects were consuming a combination of vitamins than single vitamin only. The most consumed combination was vitamin C and D. Over half of the vitamin consumers took their vitamin supplements once daily and got information about the usage direction by reading the packaging label. The majority of the respondents admitted having positive health outcomes within one week (Table 2).

Most of the respondents purchased supplemental vitamins from private pharmacies and read the instruction for use on the packaging. Almost all of the vitamin consumers perceived a positive change in their health and over half (55.46%) reported that the change occurred within one week after they took the supplements.

Besides supplemental vitamins, our respondents also consumed herbal (traditional) medicines. Ginger was the most common plant used as herbal medicine consumed by study participants (79 persons or 92.94%) to improve immunity during the pandemic. Most of the participants consumed herbal medicines in liquid form (54.43%). The most common source of information about herbal medicines among the study participants was their family and relatives (58.23%). Most of the participants obtained herbal medicines from modern retailers (super/minimarkets) (55.70%) (Table 3).

There were more females than males in our study who took vitamin supplements and herbal medicines. Those with the elementary school as their highest educational level consumed vitamins and herbal products in equal amounts. Meanwhile, we found more vitamin consumers than herbal consumers among those who had high school as their highest educational level. Those having university degrees generally consumed both supplemental vitamins as well as herbal medicines.

For at least one week after the consumption, there were more vitamin consumers than herbal consumers who perceived positive changes in their health. There was only one herbal consumer who had a university degree who reported positive health changes within one week. On the other hand, there were 5 respondents with the same educational level who reported positive health changes within one week of consuming vitamin supplements.

**Table 1.** Respondents' knowledge about COVID-19 and immunity (n: 85)

| | | n | % |
|---|---|---|---|
| 1 | Disease caused by the virus that attacks the respiratory tract | 66 | 77.65 |
| 2 | The way the virus is transmitted | | |
| | – Direct contact with an infected person | 3 | 3.53 |
| | – Someone's cough spray | 2 | 2.35 |
| | – Direct contact with an infected person and someone's cough spray | 66 | 77.65 |
| | – Through things contaminated by the virus, the air and others (indirect contact) | 14 | 16.47 |
| 3 | The symptoms include cough, fever, sore throat, and breathing problems | 77 | 90.59 |
| 4 | COVID-19 can be transmitted when people are gathering | 75 | 88.24 |
| 5 | Sources of information about the mechanism of COVID-19 transmission | | |
| | – Television | 2 | 2.35 |
| | – Handphone | 0 | 0.00 |
| | – Neighbour | 6 | 7.06 |
| | – Family/relatives | 1 | 1.18 |
| | – Multi-sources | 74 | 87.10 |
| | – Never heard | 2 | 2.35 |
| 6 | Settings where health protocol is needed * | | |
| | – In the market | 74 | 87.06 |
| | – At home | 68 | 80.00 |
| | – In families' or relatives' house | 68 | 80.00 |
| | – In health facilities | 67 | 78.82 |
| | – Workplace | 65 | 76.47 |
| 7 | Knowledge about meaning of body immunity | | |
| | – The body's ability to survive | 15 | 17.65 |
| | – The body's ability to avoid viruses | 18 | 21.18 |
| | – The body's ability to fight pathogenic organisms | 30 | 35.29 |
| | – The body's ability to bind bacteria | 11 | 12.94 |
| | – The body's ability to kill germs | 11 | 12.94 |
| 8 | Type of vitamin supplements to improve immunity * | | |
| | – Single vitamin supplement | 74 | 87.06 |
| | – Mineral supplement | 62 | 72.94 |
| | – Herbal medicines | 70 | 82.35 |
| | – Multivitamin supplement | 41 | 48.24 |
| | – Combination of supplements and herbal medicines | 45 | 52.94 |
| 9 | Other ways needed to improve immunity * | | |
| | – Consume nutritious food | 77 | 90.59 |
| | – Drink enough water | 66 | 77.65 |
| | – Get enough rest | 70 | 82.35 |
| | – Routine exercise | 63 | 74.12 |
| | – Avoiding stress | 66 | 77.65 |
| | | 59 | 69.41 |

*Respondents could select multiple-answers

**Table 2.** Respondent's behavior of consuming vitamin supplements (n: 81)

| | | N | % |
|---|---|---|---|
| 1 | Sources of vitamin supplements consumed by respondents * | | |
| | – Health care facilities (hospital, primary health care, clinic) | 33 | 40.74 |
| | – Private health practitioner | 27 | 33.33 |
| | – Pharmacy | 59 | 72.84 |
| | – Drug store | 15 | 18.52 |
| | – Supermarket/minimarket | 13 | 16.05 |
| | – Online shop | 10 | 12.35 |
| 2 | Kind of vitamin supplement consumed by respondents * | | |
| | – Vitamin A | 19 | 23.46 |
| | – Vitamin B complex | 24 | 29.63 |
| | – Vitamin C | 65 | 80.25 |
| | – Vitamin D | 30 | 37.04 |
| | – Vitamin E | 7 | 8.64 |
| | – Vitamin K | 5 | 6.17 |
| 3 | Type of vitamin supplement consumed by respondents | | |
| | – Vitamin A | 1 | 1.23 |
| | – Vitamin B complex | 0 | 0.00 |
| | – Vitamin C | 24 | 29.63 |
| | – Vitamin D | 8 | 9.88 |
| | – Vitamin E | 0 | 0.00 |
| | – Vitamin K | 0 | 0.00 |
| | – Combination of vitamins | 48 | 59.26 |
| 4 | Respondents who consume vitamin C and also vitamin D | 20 | 24.69 |
| 5 | The most frequent of vitamins consumed by respondents is once a day | 59 | 72.84 |
| 6 | Sources of knowledge of respondents about the regiment of vitamin supplements | | |
| | – Supplement's label | 44 | 54.32 |
| | – Health professionals such as doctors, pharmacistst & nurse | 14 | 17.28 |
| | – Media | 10 | 12.35 |
| | – Family and relative<br>– N/A | 10<br>3 | 12.35<br>3.70 |
| 7 | The proportion of respondents that felt a good change in their bodies after consuming vitamins | 79 | 97.53 |
| 8 | Perceived length of days leads to the change happened on the respondents' bodies | | |
| | – 1 to 3 days | 22 | 27.16 |
| | – 1 week | 45 | 55.56 |
| | – 1 month | 6 | 7.41 |
| | – > 1 months<br>– N/A | 6<br>2 | 7.41<br>2.47 |
| 9 | Perceived benefit of consuming vitamin supplement | | |
| | – More energetic | 19 | 23.46 |
| | – Healthier | 37 | 45.68 |
| | – Better and fresher | 12 | 14.81 |
| | – More stamina<br>– N/A | 11<br>2 | 13.58<br>2.47 |

*Respondents could select multiple-answers

**Table 3.** Respondent's behavior of consuming herbal medicines (n: 79)

| | | n | % |
|---|---|---|---|
| 1 | The type of consumed herbal medicines by respondents * | | |
| | – Ginger | 32 | 40.51 |
| | – Turmeric | 26 | 32.91 |
| | – Curcuma | 22 | 27.85 |
| | – Cutcherry | 19 | 24.05 |
| | – Meniran leaves (*Phyllanthus niruri* L.) | 10 | 12.66 |
| | – Andrographis paniculate | 8 | 10.13 |
| | – Virgin Coconut Oil (VCO) | 5 | 6.33 |
| | – Guava leaves and fruits | 5 | 6.33 |
| 2 | Dosage form of the consumed herbal medicines | | |
| | – Powder | 8 | 10.13 |
| | – Liquid | 43 | 54.43 |
| | – Tablet | 5 | 6.33 |
| | – Capsule | 7 | 8.86 |
| | – Fresh plants | 16 | 20.25 |
| 3 | The most common frequency of herbal medicine consumed by respondents is once a day | 47 | 59.49 |
| 4 | Sources of information about herbal medicines as immune enhancers * | | |
| | – Health professionals such as doctors, pharmacists & nurse | 6 | 7.59 |
| | – Media | 17 | 21.52 |
| | – Family and relatives | 46 | 58.23 |
| | – Self-experience | 25 | 31.65 |
| 5 | Sources of herbal medicines consumed* | | |
| | – Health care facilities (hospital, primary health care, clinic) | 10 | 12.66 |
| | – Pharmacy | 14 | 17.72 |
| | – Drug store | 31 | 39.24 |
| | – Supermarket/minimarket | 44 | 55.70 |
| | – Online shop | 2 | 2.53 |
| | – Traditional market | 26 | 32.91 |
| 6 | Perceived length of days leads to the change happened on the respondents' bodies | | |
| | – 1 year | 8 | 10.13 |
| | – 1 month | 9 | 11.39 |
| | – 1 week | 28 | 35.44 |
| | – < 1 week | 19 | 24.05 |
| | – Until feeling healthy | 15 | 18.99 |
| 7 | Perceived benefit after consuming herbal medicines | | |
| | – More energetic | 19 | 24.05 |
| | – Healthier | 23 | 29.11 |
| | – Better and fresher | 22 | 27.85 |
| | – More stamina | 15 | 18.99 |
| 8 | Perceived side effects of herbal medicines * | | |
| | – Nausea/vomiting | 9 | 11.39 |
| | – Liver problem | 3 | 3.80 |
| | – Allergy | 7 | 8.86 |
| | – Kidney disorder | 5 | 6.33 |
| | – Sleep disturbances | 12 | 15.19 |
| | – No side effect | 49 | 62.03 |

*Respondents could select multiple-answers

**Table 4.** Vitamin supplements and herbal medicines consumption by background characteristics of the respondents

| Variable | Respondents consumed vitamin supplements (n = 81) | | Respondents consumed herbal medicines (n = 79) | | Respondents consumed both vitamin supplements and herbal medicines (n = 75) | | Respondents perceived health benefits within one week after consumption of vitamin supplements (n = 45) | | Respondents perceived health benefits within one week after consumption of herbal medicines (n = 28) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. (%) | p | Freq. (%) | p | Freq. (%) | p | Freq. (%) | p | Freq. (%) | p |
| Gender | | | | | | | | | | |
| Male | 38 (46.91%) | 1.00 | 37 (46.84%) | 1.00 | 35 (46.67%) | 1.00 | 19 (42.22%) | 0.37 | 16 (57.14%) | 0.46 |
| Female | 43 (53.09%) | | 42 (53.16%) | | 40 (53.33%) | | 26 (57.78%) | | 12 (42.86%) | |
| Age | | | | | | | | | | |
| < 70 | 56 (69.14%) | 1.00 | 53 (67.09%) | 0.17 | 50 (66.67%) | 0.17 | 32 (71.11%) | 0.49 | 23 (82.14%) | 0.15 |
| ≥ 70 | 25 (30.86%) | | 26 (32.91%) | | 25 (33.33%) | | 13 (28.89%) | | 5 (17.86%) | |
| Level of education | | | | | | | | | | |
| Elementary school | 32 (39.51%) | 0.33 | 33 (41.77%) | 0.54 | 30 (40.00%) | 0.42 | 18 (40.00%) | 0.24 | 12 (42.86%) | 0.40 |
| Middle school | 43 (53.09%) | | 40 (50.63%) | | 39 (52.00%) | | 22 (48.89%) | | 15 (53.57%) | |
| Academy/ University | 6 (7.41%) | | 6 (7.59%) | | 6 (8.00%) | | 5 (11.11%) | | 1 (3.57%) | |
| Job category | | | | | | | | | | |
| Farmer/ fisherman | 14 (17.28%) | 0.32 | 12 (15.19%) | 0.30 | 12 (16.00%) | 0.23 | 7 (15.56%) | 0.09 | 5 (17.86%) | 0.33 |
| Self-employed & Private sector | 15 (18.52%) | | 15 (18.99%) | | 15 (20.00%) | | 8 (17.78%) | | 9 (32.14%) | |
| Housewife | 30 (37.04%) | | 29 (36.71%) | | 27 (36.00%) | | 19 (42.22%) | | 7 (25.00%) | |
| Unemployed/ Retired | 22 (27.16%) | | 23 (29.11%) | | 21 (28.00%) | | 11 (24.44%) | | 7 (25.00%) | |

## DISCUSSION

The elderly population in Indonesia is dominated by the youngest-old who are still below 70 and the proportion of the female elderly is slightly higher than the males [8]. We found a similar proportion of the active members of the "Mawar" Elderly Posyandu in North Jakarta. Generally, those who become active Posyandu members had been married. In Indonesia, people entering the age of 60 are usually already retired. Therefore, our study participants contain a considerable proportion of those who are no longer employed. Several studies have been conducted in various Asian countries on the knowledge, attitudes, and behavior of people around COVID-19, but study focusing on the elderly group is still lacking. However, a Pakistani study found that old age is a predictor of negative attitudes towards the COVID-19 pandemic there [20].

Interestingly, although most of our respondents had a low educational level, it turned out that they had an appropriate understanding of COVID-19, either of the symptoms, the transmission, or how to prevent it. In addition, almost all of the elderly who became our respondents tried to boost their immunity by taking vitamin supplements as well as herbal medicines. Additionally, the active members of Posyandu are typically the ones having high awareness of health. Since our study subjects were limited only to Posyandu members, the results would probably be different if we have performed the study on a population with more diverse characteristics. Posyandu also regularly give informal health education session for the members. It has been proved that active members of elderly Posyandu have a better quality of life than elderly who do not become active Posyandu members [21].

Most of our respondents rely on more than one source to get information about the transmission of COVID-19 as well as the recommended preventive measures (Table 1). In the current era where information is easily spread and sometimes even overloaded, formal education may not be essential to get proper knowledge about COVID-19 and the pandemic situation. The proportion of the respondents based on their education is also similar to the data of the elderly population in Jakarta, where those who never finished junior high school are dominant [8].

Our study subjects were dominated by females. Females were reported by previous studies to be more likely to perform self-medication [22], take health supplements [23], and have higher levels of preventive behaviors [24]. Similarly, there were more females than males in our study who took vitamin supplements and herbal medicines. Almost all of our respondents believe that consuming nutritious foods is an important habit needed to prevent COVID-19. One way to maintain the body's immunity is indeed to eat a balanced diet that contains a sufficient amount of vitamins and minerals.

The majority of the active members of "Mawar" Elderly Posyandu consume either supplemental vitamins or herbal medicines. Vitamin supplements were consumed by 81 respondents, while herbal medicines were consumed by 79 respondents (Table 2 & 3). The most consumed vitamin combination among the study subjects were vitamin C and D. Both of those vitamins are indeed scientifically recommended to prevent COVID-19 infection as they can enhance the immune system and reduce the severity of the disease; thus included in the official guideline of COVID-19 treatment [25]. Meanwhile, vitamin C is the most common vitamin taken by our subjects who consumed a single vitamin supplement (Table 2), just like what has been found by other studies of supplement consumption during this pandemic [11]. Places where our elderly subjects usually obtained vitamin supplements (pharmacies, health care facilities, and private practices (Table 2) share a common characteristic, which is served by health professionals. This is likely because the Indonesian elderly typically require routine check-ups at such healthcare facilities to control chronic diseases [26].

On the other hand, most of them obtained herbal medicines from places that are not supervised by health workers (Table 3). Indonesia allows over-the-counter including herbal medicines to be sold in drug stores, which are similar to pharmacies but not supervised by a pharmacist. As our results tell, the traditional or wet market is the source of herbal medicines for almost a third of our elderly subjects. Indeed, it is common for Indonesians to make herbal drink from fresh or dried plants that can be purchased from wet markets. Generally, those who use herbal medicines understand herbals as immune enhancers based on the information they get from relatives. Meanwhile, those using vitamin supplements are likely to receive information about vitamin benefits from health professionals, as most of them obtain their supplements from pharmacies and healthcare facilities [12].

Traditional or herbal medicines are generally recognized as safer than modern medicines and therefore it is perceived as important by Indonesian society, especially the lay people [27]. The herbal medicines are worth to be promoted among the Indonesian elderly since their acceptability is better for this group of population because of their

traditional aspect. In this country, jamu has long been acknowledged as herbal medicine originating from traditional Indonesian culture and the government also supports its rationalization as phytopharmaceutical [27].

It should be expected that the health benefit from herbal medicines do not come instantly since the active ingredients which are certain secondary metabolites usually contained in the plants are in low concentration [15]. The health benefit from phytotherapy is also typically based on the synergistic effects of different molecules found in the plant [28]. On the other hand, herbal medicines have high availability in Indonesia and most are sold at cheap prices. Besides that, some herbals already have scientific evidence about their role in enhancing immunity to fight COVID-19 infection [29].

## CONCLUSION

The active members of "Mawar" Elderly Posyandu mostly have sound knowledge and attitude regarding COVID-19 despite the low level of education. Almost all of them consume at least one vitamin supplement and/or herbal medicines. Based on our findings, we would like to recommend that the government strengthen the revitalization of elderly Posyandu as a part of the Community Health Centers (Puskesmas) since the participants of elderly Posyandu have been shown to have good knowledge and attitudes about the COVID-19 pandemic and the use of supplements and herbal medicines. The Posyandu cadres need to give adequate education about the use of herbal medicines. It is worth consuming herbal medicines rationally for some time because, unlike vitamin supplements, the health benefits of herbals do not come instantly.

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