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Analysis of the Consumption Patterns of Health Supplements in Health Care Worker in the Era of the COVID-19 Pandemic

Aliffa Putri, Wening Sari*

School of Medicine, YARSI University, Jakarta 10510, Indonesia

*Corresponding author:
E-mail: Wening.sari@yarsi.ac.id

ABSTRACT

Health workers are at the forefront of handling COVID-19, so they have a high risk of contracting the virus. There have been 1.967 deaths in Indonesian health workers due to COVID-19, the highest number in Asia. While on the job, health workers must maintain a healthy immune system and use personal protective equipment. It is believed that taking vitamins, minerals, and herbs can help boost endurance. This study aims to examine the pattern of health supplement consumed in health workers during the COVID-19 pandemic. This research was conducted with a Cross-Sectional approach carried out on 100 health workers by providing questionnaires related to the types and effects of health supplements consumed by health workers in the era of the COVID-19 pandemic. From all respondents who took supplements, 75.2% consumed every day during the pandemic, whereas only 40.6% did before the pandemic. Prior to the pandemic, it was discovered that 33% of respondents took more than two types of health supplements. However, during the pandemic, it was revealed that 65% took more than two types of health supplements. There was an increase in respondents who took supplements believed to improve the immune system (80.2% vs 50.5%). Consumption of herbs and honey increased during the pandemic (19.8% vs 40.6%), with honey the most consumed. During the pandemic, health workers take more health supplements and a more comprehensive range of supplements.

Keywords: COVID-19, health supplements, health workers, immune system

Introduction

In December 2019, 44 cases of pneumonia were reported in Wuhan, Hubei Province, China, as a result of infection with a new, unidentified coronavirus (Zhu et al., 2020). The virus was later dubbed SARSCoV-2 due to its genome sequence's 82% similarity to SARS-CoV (Severe Acute Respiratory Syndrome Coronavirus), which caused a disease outbreak in Guangzhou, China 2003. (Zhu et al., 2020). The disease caused by SARS-CoV-2 infection is then known as COVID-19 (Coronavirus Disease 2019) (WHO, 2020).

According to WHO, as of January 16, 2021, there were 91,816,091 people worldwide infected with Covid-19. There have been 1,986,871 Covid-19 patients among the 91 million positive cases of corona (WHO, 2020). Meanwhile, in Indonesia, the death rate of Covid-19 patients increased by 209 people (8.39 %), while the number of positive patients recovered by 192 people (7.70 %). Based on the comparison of these data, Indonesia continues to see an increase in the number of deaths and patient recovery rates (WHO, 2020).

The public health conditions associated with COVID-19 transmission are divided into four categories: suspected cases, probable cases, close contacts, and confirmed cases (Kemenkes RI, 2020). On January 16, 2020, data from Indonesia revealed 66,573 suspected cases and 882,418

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confirmed cases (Jakarta Smart City, 2020). According to studies, the probability of medical personnel becoming infected with Covid-19 is 3.8%, owing primarily to unprotected initial contact with infected patients (Liu et al., 2020). According to WHO, more than 22,000 medical workers in 52 countries and regions have been declared infected with COVID-19 (Lubis, 2020).

Using personal protective equipment while on duty is one way to reduce the risk of COVID-19. When dealing with COVID-19 patients, health workers must wear various protective clothing, including hazmat suits and N95 masks. Not only must health workers wear external protection, but they must also take care of their health in order to maintain a robust immune system.

Consuming nutritious and balanced food, getting enough rest, avoiding stress, improving the digestive system or hormones, and taking health supplements are just a few of the things that can be done to boost the immune system (Izazi & Kusuma, 2020).

Health supplements are products to complete nutritional needs, increase, maintain, and or have value nutritional and/or physiological effects, improve health functions, contain one or more ingredients in the form of vitamins, minerals, amino acids, and/or other non-plant ingredients that can be combined with plants (BPOM, 2019).

Nutrition is an essential factor in maintaining good health. Immunomodulatory effects of major dietary components such as vitamins C, D, E, zinc, selenium, and omega-three fatty acids are well established. Some of these nutrients have also been shown to have potential roles in COVID-19 management (Shakoor et al., 2020).

It is critical for health workers to maintain endurance during the COVID-19 pandemic by consuming various supplements. However, it is not yet known whether there has been a change in the pattern of supplement consumption in health workers during this pandemic. As a result, research on the use of health supplements to prevent and/or reduce the negative impact of COVID-19 on health workers are required in the era of the COVID-19 pandemic.

Material and Methods

This cross-sectional study was conducted online, with data collected using a measuring instrument in a questionnaire in Google form. This study's population consisted of health care workers in East Jakarta who provided medical services during the covid-19 pandemic. The study takes place between October and November of 2021. A total of 101 people were included in the sample. Convenience sampling was used to select samples. Univariate analysis was used to analyse the data. The YARSI University Ethics Committee approved this study with letter number: 402/KEP-UY/BIA/XII/2021.

Results and Discussion

Sociodemographic characteristic of respondent

Respondent data analysis is required to learn about the respondents' backgrounds, which will be used as input to clarify research data. The following summarizes the respondents' characteristics, organized by gender, age range, last education, profession, workplace, and family income.

The health care workers who underwent clinical services during the COVID-19 pandemic era in this study were mostly female, as many as 52 respondents (51.49%), while male as many as 49 respondents (48.51%). In the age range, most of the respondents in this study were 20 – 30 years, as many as 58 respondents (57.43%), while at 31-40 years, there were 36 respondents (35.64%). The most recent education of respondents was bachelor as many as 77 respondents (76.24%). Most professions in this study were General Practitioners, namely 40 respondents (30.69%) and Nurses as many as 32 respondents (31.68%). The most work institutions in this study were hospitals with as many as 40 respondents (30.69%) and Puskesmas (Primary Health Service) as many as 31 respondents (30.69%). Meanwhile, the highest family income is in the range of IDR10,000,000-IDR 20.000.000 and IDR20.000.000 - IDR30.000.000 respectively, with 44 respondents (43.56%) and 35 respondents (34.56%) (Table 1).

Table 1. Sociodemographic characteristic of respondent

Variable	n	%	Variable	n	%
Gender			**Profession**		
Male	49	48.51	Midwife	12	11.88
Woman	52	51.49	Dentist	9	8.91
Age			Medical Specialist	8	7.92
20 - 30 years	58	57.43	General Practitioners	40	39.60
31 - 40 years	36	35.64	Nurse	32	31.68
41 - 50 years	5	4.95	**Workplace**		
>50 years	2	1.98	Clinic	24	23.76
Education			Independent Practice	6	5.94
Diploma	14	13.86	Public Health Centre	31	30.69
Bachelor	77	76.24	Hospital	40	39.60
Master	1	0.99	**Income (IDR)**		
Specialist	7	6.93	10,000,000 – 20,000,000	44	43.56
Sub-Specialist/ Consultant	2	1.98	21,000,000 – 30,000,000	35	34.65
			31,000,000 - 40.000.000	15	14.85
			>40,000,000	7	6.93

The consumption of health supplement

The types of health supplements consumed by health workers before and after the pandemic did not differ, namely vitamins A, B, C, D, E, multivitamins, calcium, and omega 3 (Table 2). The apparent difference is that 40% of respondents did not take these supplements, whereas all respondents took supplements during the pandemic. During the pandemic, supplement consumption increased, with vitamin E showing a tremendous increase (2% vs. 13%), while vitamins C, D, and A were the most commonly consumed supplements.

Table 2. Health supplements consumed

Health supplements consumed			
Before pandemic		During Pandemic	
Types	%	Types	%
Vitamin A	15%	Vitamin A	18%
Vitamin B	6%	Vitamin B	13%
Vitamin C	13%	Vitamin C	21%
Vitamin D	13%	Vitamin D	16%
Vitamin E	2%	Vitamin E	13%
Multivitamin	2%	Multivitamin	6%
Kalsium	4%	Kalsium	6%
Omega 3	5%	Omega 3	8%
Not at all	40%		

Prior to the pandemic, most respondents (47%) only used one type of health supplement (Table 3). Most respondents (65%) consumed more than two different types of supplements during the pandemic, a 32% increase from before the pandemic.

Table 3. Number of types of health supplements consumed

Number of types of health supplements consumed			
Before pandemic		During pandemic	
Number	%	Number	%
1	47	1	18
2	21	2	18
3	10	3	23
4	9	4	16
5	11	5	14
6	2	6	11
7	1	7	1

Before the pandemic, most respondents (83 %) did not consume supplements derived from herbs or honey. During the pandemic, there has been a shift in the consumption of herbs and honey (Table 4). Prior to the pandemic, only 2% of respondents consumed honey. During the pandemic, the proportion of respondents who consumed honey increased dramatically to 29%. The respondents drank beras kencur, the main component of *Kaempferia galanga*, aromatic ginger. Kunyit asam, a combination drink of *Curcuma longa* Linn and *Tamanrindus indica*, was another herbal drink. Both herbal drinks are traditional and widely consumed in Indonesia. *Kaempferia galanga* has been used to treat the flu, dry cough, toothache, rheumatism, and hypertension (Wang et al., 2021). *Curcuma longa* Linn has antioxidant, anti-inflammatory, anticancer, and antihyperlipidemic properties. (Helwings & Kalman, 2017).

Table 4. The consumption of herbs/honey

The consumption of herbs/jamu /honey supplements			
Before pandemic		During pandemic	
Types of supplement	%	Types of supplement	%
Beras kencur	1	Beras kencur	3
Another herbal drink	4	Another herbal drink	5
Honey	2	Honey	29
Kunyit Asam	10	Chinese medicines	1
Not at all	83	Not at all	62

Furthermore, herbal supplements of honey revealed that respondents consumed herbal supplements such as honey before the pandemic (10%) and during the pandemic (29%). As a result, herbal supplements such as honey increased by 19%. Honey also has health benefits as a result of its varied nutritional content. Honey contains various active compounds, including vitamin A (retinol), vitamin E (tocopherol), vitamin K, vitamin B complex, and vitamin C, as well as flavonoids, phenolic acids, and carotenoids. This content can also be found in other bee-produced products, such as propolis. Honey contains phytonutrient compounds that can help the body's immune cells. Of course, this reduces the possibility of infectious diseases, allowing the honey to be used as a natural supplement that boosts endurance (Oktianti et al., 2019).

During the pandemic, an increasing number of health workers are taking supplements that are thought to have an immunomodulatory effect, boosting the immune system (Table 5). Most supplements are phytopharmaca which contains *Echinacea purpurea* (48%). *Echinacea* is best known as an immunostimulant. Numerous studies back up these immunomodulatory effects with innate and specific immunity increases. However, anti-inflammatory properties have been reported and anti-viral and anti-microbial effects, supporting its use in traditional medicine (Catanzaro et al., 2018).

Table 5. The consumption of immunomodulatory supplements

The consumption of immunomodulatory supplements			
Before pandemic		During pandemic	
Types of supplements	%	Types of supplements	%
*Echinacea purpurea**	27	*Echinacea purpurea**	48
Isoprinosin	5	Isoprinosin	13
*Phyllanthus niruri**	18	*Phyllanthus niruri**	16
Not at all	50	Not at all	23

*The main ingredient of phytopharmaca

When it was confirmed that the difference in consumption patterns of health supplements was 57 respondents (56%), the health care workers admitted that the number of supplements consumed during the pandemic was more than before (Table 6). In contrast, the second-largest pattern was that the types of supplements consumed during the pandemic were more varied and more numerous than before, which was 18 respondents (17%) (Table 7). Based on the Wilcoxon-Rank test results, a p-value of 0.000 was obtained. When compared to the 5% significance level, the p-value is lower, indicating differences in the pattern of supplement use among health workers before and during the COVID-19 pandemic. This condition indicates that the use of health supplements such as vitamin D, vitamin C, and zinc consumed by health workers undergoing clinical services during the pandemic increased compared to before. Supplements consumed during the pandemic are more diverse and more significant than before the pandemic.

Table 6. The frequency of health supplements consumed before and during the covid-19 pandemic

Intensity	Before pandemic		During pandemic	
	n	%	n	%
Not at all	11	10.89	0	0.00
2-3 every month	9	8.91	3	2.97
2-3 every week	31	30.69	20	19.80
Once every week	9	8.91	2	1.98
Daily	41	40.59	76	75.25

Table 7. The consumption patterns of health supplements before and during the COVID-19 pandemic

The consumption pattern	%
No difference in the type and amount of supplements consumed	17
The number of supplements consumed is more significant and more varied during the pandemic	18
The types of supplements consumed are more varied during the pandemic	9
The number of supplements consumed is more significant during the pandemic	56

The difference in the pattern of using health supplements for health workers before and during the COVID-19 pandemic in this study is also consistent with the findings of previous studies. This study discovered an increase in public awareness of health by consuming vitamins, as measured by an increase of 9.4% based on the findings of this study. Consuming vitamins such as vitamin C and multivitamins containing iron is thought to prevent the transmission of the coronavirus, so people are advised to be cautious when selecting and using supplements (Lidia, 2020).

The health care workers claim to feel much more fit due to taking supplements as many as 84 respondents (27.5%), while on the effect of feeling not vulnerable in a disease as many as 61 respondents (19.9%). On the effect of sleeping more soundly, there are 57 respondents (18.6%). The respondents admit that the effect is frequent urination and smooth defecation, respectively

55 respondents (18%) and 49 respondents (16%) (Table 8). Regarding the effect felt by health workers, it can be seen that 84 respondents (27.5 %) claimed to feel much fitter due to the effects of taking supplements. In comparison, 61 respondents claimed to feel less vulnerable to disease due to the effects of taking supplements (19.9%). As many as 57 people responded to the effect of sleeping more soundly (18.6%). The remainder is respondents who admit that the effect is frequent urination and smooth defecation, 55 (18%) and 49 respondents, respectively (16%). The World Health Organization recommends taking vitamin and nutritional supplements. Aside from that, several health workers have expressed concern about the side effects of supplement use, such as frequent urination. This condition is due to differences in the reabsorption and filtration reactions of supplements to the kidneys and other organs in each health worker's body, which have different responses, resulting in varying levels of side effects (Nugroho et al., 2020).

Table 8. The benefits of health supplements perceived by respondents

Benefits	**%**
Smooth defecation	16
Frequent urination	18
Not easy to get sick	10
Feel more fit	27
Better sleep quality	19

The COVID-19 infection

This study also explores whether respondents were exposed to COVID-19 infection while on duty. The goal is to see if consuming health supplements can prevent health workers from being infected with COVID-19. Around 43% of respondents were exposed to COVID-19 (Table 9), and most respondents (80.5%) were infected before receiving the vaccination. Respondents reported asymptomatic 58%, mild symptoms 26%, moderate symptoms without hospitalization 12%, and as many as 4% had moderate symptoms but required hospitalization.

Table 9. The confirmation and symptoms of COVID-19

Variable	%
Confirmed positive to COVID-19	
Yes	43
No	57
Time of Exposure to COVID-19	
Pre-Vaccine	80.5
Post 1st Vaccine	13.8
Post 2nd Vaccine	5.5
Symptoms of COVID-19	
Mild symptoms while self-isolation	26
Moderate symptoms while hospitalized	4
Moderate symptoms while self-isolation	12
Asymptomatic	58

Based on this data, it cannot be connected that the consumption of health supplements can prevent infection with COVID-19 because many factors are involved, such as vaccination, the intensity of exposure of COVID-19 patients, or fatigue factors. The severity of COVID-19 in this study was lower than the study results reported by Wu and McGoogan (2020); about 80.9% of infected patients showed mild symptoms, 13.8% severe symptoms, and 4.7% critical.

There is a relatively small difference, namely only 14%, between health workers who are not exposed to Covid-19 and those exposed to Covid-19, with 57% claiming not to have been exposed

to Covid-19 and 43% claiming to have been exposed to Covid-19. Then, when it came to the timing of Covid exposure, health workers admitted that as many as 29% of health workers were exposed to Covid-19 before being vaccinated. In comparison, only 2% and 4% were exposed to Covid-19 after being vaccinated. Furthermore, the highest percentage of symptoms reported during the Covid-19 pandemic was obtained, with 58% of health workers claiming no symptoms. The highest percentage of health workers who claim to have been exposed to Covid-19, 26%, has mild symptoms and is self-isolating. This also suggests that the health workers' immune systems are strong and capable of combating Covid-19 even amid their intense work with Covid-19 patients. This is, of course, widely supported by several factors, including the consumption of health supplements and vaccination. Although it is unclear whether there is a link between health supplements and Covid-19, as in previous studies, health supplements are products that can increase endurance by supplementing nutritional needs, maintaining, improving, and/or improving health functions. (BPOM, 2019). Not to mention the presence of complete medical equipment and personal protective equipment (PPE) to protect them from infection with the Covid-19 virus.

Conclusion

Based on the findings of previous studies and discussions about the pattern of health supplement use in health workers during the COVID-19 pandemic, the following conclusions were achieved:

1. There was a significant difference (p=0.00) in the consumption pattern of supplements for health workers before and during the pandemic. Before the pandemic, respondents who consumed supplements every day were 40.6% and increased to 75.2%. The number of respondents who consumed two health supplements was significantly different before and during the pandemic (33% vs. 65%). Numerous respondents who took supplements believed that a boost in the immune system increased between before and during the pandemic (50.5% vs. 80.2%). The consumption of traditional herbal supplements and honey (19.8% vs. 40.6%) increased.
2. Vitamins C, A, B, D, E, Omega, and Multivitamins were the most commonly consumed health supplements by health workers during the Covid-19 pandemic. Imboost and honey supplements are traditional immunomodulatory supplements that health workers frequently consume during the pandemic.
3. There is an increase in various health supplements:
   3.1 There was an increase in vitamin C consumption by health workers by 8% before and during the pandemic. Furthermore, health workers who consume vitamins A, B, D, E, Omega, and Multivitamins increase in line with the pandemic.
   3.2 A total of (10%) of health workers regularly consumed honey before the pandemic, while there were (29%) during the pandemic. Thus, there was an increase in herbal supplements such as honey by 19%.
   3.3 Imboost is still the most widely consumed immunomodulator. There was an increase in Imboost consumption by 25% before and during the pandemic.
4. The most significant effect felt by health workers after consuming health supplements during the COVID-19 pandemic was feeling much more fit, as reported by 84 respondents (27.5%).

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