Dietary Supplement Intake is Differed by Covid-19 Risk Perception and Media Exposure among Indonesian Social Media Users

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ABSTRACT

Indonesian government implemented large scale social distancing with the limitation of major public activities, except vital sectors, to control the transmission of Covid-19 since its first case on March 2020. In early June 2020, Indonesia entered the new normal period when the government starts to open several public places, including offices. The high rate of people mobilization might increase the risk of the virus transmission, therefore, the new normal period forced people to be ready for taking individual measures to protect themselves from the virus transmission, such as washing hands, wearing mask, avoid crowds, or even taking nutrient supplement to improve their immune system. This study aims to investigate the role of media and Covid-19 risk perception on driving the supplement intake. An online survey based on social media (WhatsApp, Instagram, Facebook, and Twitter) was completed by 715 participants on June 2020. The results showed that the supplement intake was differed by age, educational background, occupation, nutritional status, Covid-19 risk perception, television, and social media news (p-value < 0.05). In conclusion, dietary supplement intake is driven by risk perception on Covid-19

Keywords: Covid-19, Risk perception, Supplement

BACKGROUND

Covid-19 has been declared as global pandemic. As per February of 2021, it has been reported that the total case is 103.989.900 and 2.260.259 deaths worldwide affected mainly the Americas, Europe, South East Asia with 12.956.439 confirmed case in this region (WHO, 2021). Since its first case on March 2020, there have been 1.217.468 Covid-19 confirmed cases in Indonesia. of them are confirmed case in Indonesia (Komite Penanganan Covid-19 dan Pemulihan Ekonomi Nasional, 2021). On March 21, 2020 Indonesian government released Peraturan Pemerintah Nomor 21 Tahun 2020. To control the transmission, the government implemented large scale social distancing with the limitation of major public activities, except vital sectors.

In early June 2020, Indonesia entered the new normal period when the government starts to open several public places. The high rate of people mobilization might increase the risk of the virus transmission. In the other hands, some people need to go out to fulfill their duties, and in some case even need to use public transportations. New normal period pushed people to be ready for taking individual measures to protect themselves from the virus transmission, such as washing hands, wearing mask, avoid crowds, or even taking nutrient supplement to improve their immune system. In this case, media and Covid-19 risk perception has a key role to provide information during this shifting period.

The role of media during transition period for new normal, in the case of COVID-19 pandemic in Indonesia, is essential. Media exposure with COVID-19 related information will increase since every kind of media platform will provide update about this pandemic every day. Source of media, media content, and frequency to access the related news will affect the willing to have more protective measures (Vai et al., 2020). Media has responsibility in its every single information because it also has role on preventing the spread of diseases (Mejia et al., 2020). Media content defines what information that people could obtain. Previous study demonstrated that the increasing of media exposure is in line with the change of perceived risk and protective behavior as shown in the case of Zika virus (Chan et al., 2018). Therefore, the content of media related to the protective behavior specific for COVID-19, which has been promoted by WHO, such as washing hands, wearing mask, social distancing, and adequate food for immune improvement is important to prevent the virus transmission.

Risk of perception also important in shaping behaviors (Vai et al., 2020) and eventually leads to the protective measures in the pandemic situation (Wise, Zbozinek, Michelini, & Hagan, 2020). The motivation of protective behavior is supported by perceived threat (Vai et al., 2020). New normal period causes high mobility of people in the middle of pandemic. It pushed the shift of behavior among people to put extra measure to prevent the infection during daily activities in the public. During this crucial period, it is important to understand the role of media and risk of perception. Therefore, this study aims to investigate the role of media and Covid-19 risk perception on driving the supplement intake among social media user in Indonesia.

METHODS

This is a cross-sectional study conducted on June 2020. The survey was conducted online based on Google Form and was distributed for 10 days on main Indonesian social media platforms (WhatsApp, Instagram, Facebook, and Twitter). The self-completed questionnaire was divided into four parts: characteristics (sex, age, educational background, body weight and height, and status of whether living with medical worker or not); Covid-19 risk perception which consists of 10 question with Likert scale; source of media exposure;

and type of nutritional supplement. A total of 715 participants were completed the survey. Independent t-test and Chi-square test with level of significance at 0.05 was done using SPSS version 22. Ethical clearance was obtained from Ethical Committee for Health Research, Universitas Muhammadiyah Prof. DR. Hamka

RESULTS

There are 494 (69.1%) supplement user and 221 (30.9%) non-supplement user in this study. According to the characteristics, the results show that there is 21.5% male and 78.5% female in this study. Mean of participants' age was 28.8 ± 8.6 years old. Participants are mostly titled bachelor's degree (50.9%) followed by high school graduate (27%) and master degree (22.1%). According to the occupation, there are academia (40.8%), employee (22.4%), government officials (14%), health workers (7.7%), entrepreneur (6.6%), and unemployed (8.5%) in this study. Based on the self-completed survey providing self-measure body weight and height, the nutritional status ranged from normal (59.4%), obese (17.6%), overweight (13.3%), and underweight (9.2%), respectively. Since this study would like to know whether living with medical workers might affect the protective behavior or not, the questionnaire is also providing those questions. It was obtained that 17.8% participants were living with health workers. There is a significant difference on the supplement use according to age, educational background, occupation, and nutritional status (p-value < 0.05).

Table 1. Characteristic of social media user

Demographic characteristic	Total *n* (%)	Supplement user *n* (%)	Non-supplement user *n* (%)	*p*-value
Sex				
Male	154 (21.5)	99 (64.3)	55 (35.7)	0.145
Female	561 (78.5)	395 (70.4)	166 (29.6)	
Age				
< 25	287 (40.1)	166 (57.8)	121 (42.2)	0.001*
≥ 25	428 (59.9)	328 (76.6)	100 (23.4)	
Educational background				
Master degree	158 (22.1)	108 (68.4)	50 (31.6)	0.001*
Bachelor degree	364 (50.9)	275 (75.5)	89 (24.5)	
High school	193 (27)	111 (57.5)	82 (42.5)	
Occupation				
Academia (teacher, student)	292 (40.8)	172 (58.9)	120 (41.1)	0.001*
Employee	160 (22.4)	118 (73.8)	42 (26.3)	
Government officials	100 (14)	79 (79)	21 (21)	
Medical staff/health workers	55 (7.7)	48 (87.3)	7 (12.7)	
Entrepreneur	47 (6.6)	38 (80.9)	9 (19.1)	
Unemployed	61 (8.5)	39 (63.9)	22 (36.1)	
Nutritional status[a]				
Underweight	66 (9.2)	44 (66.7)	22 (33.3)	0.045*
Normal BMI	425 (59.4)	295 (69.4)	130 (30.6)	
Overweight	95 (13.3)	61 (64.2)	34 (35.8)	
Obese	126 (17.6)	94 (74.6)	32 (25.4)	
Living with medical staff/health workers				
Yes	127 (17.8)	96 (75.6)	31 (24.4)	0.080
No	588 (82.2)	67.7 (494)	190 (32.3)	

[a]an estimation according to self-completed survey providing body weight and height compared to classification by Ministry of Health, Republic of Indonesia, 2013
*Chi-square test, *p*-value < α (0.05)

Vitamin C was the most used dietary supplement among participants, followed by herbal supplement, iron, fish oil, vitamin B, vitamin E, calcium, zinc, folate, vitamin D, probiotic, fiber, magnesium, vitamin K, iodine, selenium, and fluorine, respectively.
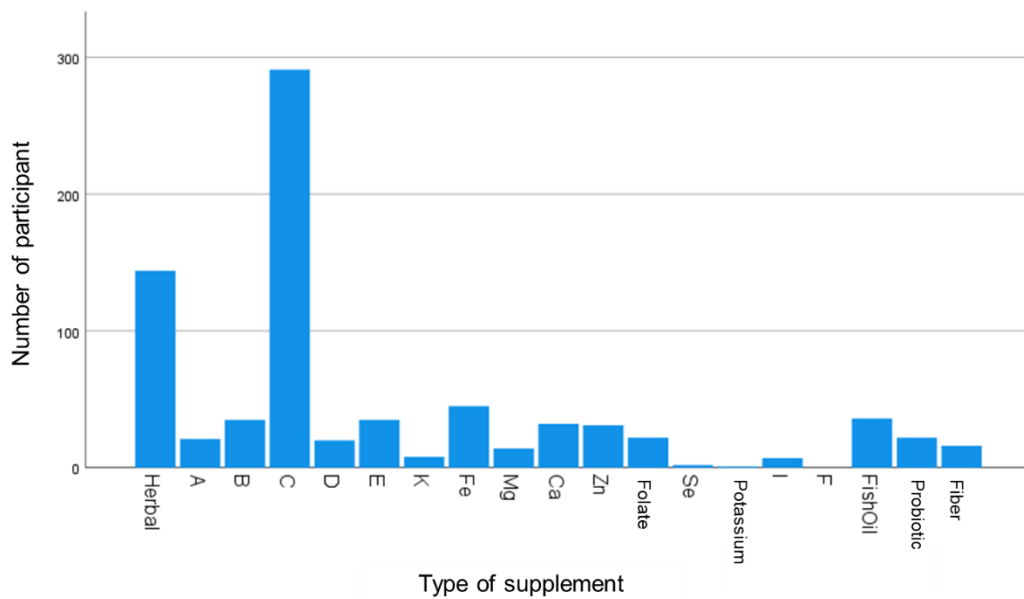
Figure 1. Number of participant consuming each type of supplement

The results of this study as shown in Table 2 shows that the highest risk perception score is that Covid-19 is more dangerous than common flu (3.38 ± 0.60). The lowest risk perception score is that about the recovery rate of Covid-19 patient (2.18 ± 0.66).

Table 2. Covid-19 risk perception among social media user

No	Aspect	Score (Mean ± SD)	Supplement user (Mean ± SD)	Non-supplement user (Mean ± SD)	p-value
1	I think it is dangerous right now to do activities outside	3.09 ± 0.65			
2	I think if I usually wear mask when doing activity outside, it will reduce the risk of transmission	2.37 ± 0.64			
3	I think if I usually washing hand using soap will reduce the risk of transmission	3.13 ± 0.54			
4	I think this disease is more dangerous than common flu	3.38 ± 0.60			
5	I worry I will be infected at workplace	3.13 ± 0.60	3.00 ± 0.30	2.94 ± 0.31	0.023*
6	I worry I will be infected at public places (shopping mall, traditional market, cafes, restaurants)	3.37 ± 0.59			
7	I worry I will be infected at public transport	3.40 ± 0.57			
8	I feel the recovery rate of Covid-19 patients are good, therefore it feels comfortable	2.18 ± 0.66			

| 9 | I feel consuming vitamin supplement will help to reduce the risk to be infected | 2.71 ± 0.59 |
| 10 | I feel nothing to be worried during this new normal period | 3.08 ± 0.66 |

Likert scoring= 1: Strongly disagree; 2: disagree; 3: agree; 4: strongly agree (reverse scoring for unfavorable statements number 8 and 10)
Independent t- test, p-value < α (0.05)

The results from analysis of risk perception also showed that supplement user has a significantly higher risk perception of Covid-19 than non-supplement user (p-value < 0.05).

Table 3. Source of media to explore information about Covid-19

Media	Overall score (Mean ± SD)	Supplement user (Mean ± SD)	Non-supplement user (Mean ± SD)	p-value
Television	2.28 ± 0.75	2.33 ± 0.74	2.18 ± 0.75	0.033*
Radio	1.56 ± 0.64	1.58 ± 0.64	1.52 ± 0.63	0.200
Printed news	1.45 ± 0.54	1.47 ± 0.54	1.40 ± 0.54	0.150
Online news	2.48 ± 0.76	2.53 ± 0.71	2.38 ± 0.83	0.020*
Social media videos	3.26 ± 0.65	3.25 ± 0.66	3.29 ± 0.64	0.500
Social media news	3.13 ± 0.70	3.15 ± 0.71	3.08 ± 0.70	0.200

Frequency score ranged from 1 to 4 (never to frequent access)
Independent t- test, p-value < α (0.05)

Table 3 shows that the most used media to explore Covid-19 related news among participants is social media videos, followed by social media news, online news, television, radio, and printed news, respectively. Even though social media are the most frequent media accessed by participant, it is television and online news that significantly differed on supplement and non-supplement user (p-value < 0.05).

DISCUSSION

This study is in line with the previous study demonstrated about the increase of supplement consumption by age (Grm, Ars, Besednjak-Kocijančič, & Golja, 2012; Kantor, Rehm, Du, White, & Giovannucci, 2016). The possible explanation is the increase of underlying health condition, behavioral change by age (Kantor et al., 2016) and protection motivation theory (Cox, Koster, & Russell, 2004). Nutritional supplement intake also more likely to increase on higher educational background (Vatanparast, Adolphe, & Whiting, 2010).

According to occupational status, the highest proportion of nutritional supplement intake was found in health workers. It is possibly explained by protection motivation theory. It is also supported by previous study that demonstrated the trend of dietary supplement intake among health workers possibly affected by heathy lifestyle. Interestingly, nutritional supplement intake was found on those with normal BMI, which also possibly explained by the motivation to have healthy lifestyle (Pouchieu et al., 2013).

Vitamin C gains more popularity after Covid-19 outbreak. Previous study showed that the Google trend of immune-related nutrient, such as vitamin C, D, zinc, omega-3 fish oil, and herbal supplements increased after the outbreak (Hamulka, Jeruszka-Bielak,

Górnicka, Drywień, & Zielinska-Pukos, 2021). This phenomena is reasonable because studies have been demonstrated vitamin C benefits for Covid-19 prevention and therapy (Carr & Rowe, 2020; Holford et al., 2020). Antioxidants provided from supplement being popular during Covid-19. However, dietary antioxidant provided from foods is also important since it contains other nutrients needed for optimal metabolism, not only a single antioxidant compound. Those nutrients might work synergistically to improve the benefit, for example lipid-soluble vitamins with oil from food (Arumsari, Mäkynen, Adisakwattana, & Ngamukote, 2020) or functional foods providing dietary fiber (Arumsari & Sofyaningsih, 2020; Sofyaningsih & Arumsari, 2021).

From this study we can imply that people might be aware that Covid-19 is dangerous enough to make people develop the disease more than the usual flu, but once the person infected, people think that they will get better soon. According to previous studies, degree of risk perception depends on the source of outbreak information people obtained. People who have personal experience regarding to the outbreak or heard the experience from the closer relatives tend to have higher risk perception (Dryhurst et al., 2020). Higher risk perception will engage to the tighter protective behavior during pandemic (Bish & Michie, 2010). In Covid-19 experience, the risk perception even higher during beginning period of this outbreak (Wise et al., 2020).

Previous study demonstrated that risk perception is a mediating role on the effect of social media use on protective behaviors (Oh, Lee, & Han, 2020) and it is related to the handwashing practice (Zhang et al., 2020). According to this study, television and online news has driven dietary supplement intake in Indonesia social media user, possibly because of the supplement product advertising. It is demonstrated previously that food advertisement in television affecting dietary behavior (Correa, Reyes, Taillie, Corvalán, & Dillman Carpentier, 2020).

CONCLUSION

According to the present study, the highest risk perception score among Indonesian social media user is the perception that Covid-19 is more dangerous than common flu. Dietary supplement intake was differed by age, educational background, occupation, nutritional status, Covid-19 risk perception, television, and social media news. Therefore, television is a potential media to promote Covid-19 preventive behavior (washing hands and wearing mask) in Indonesian society.

CONFLICTS OF INTEREST

There is no conflict of interest declared

REFERENCES

Arumsari, I., Mäkynen, K., Adisakwattana, S., & Ngamukote, S. (2020). Effects of Different Cooking Methods and Palm Oil Addition on the Bioaccessibility of Beta-Carotene of Sweet Leaf (Sauropus androgynous). *Journal of nutritional science and vitaminology, 66*(Supplement), S202-S205.

Arumsari, I., & Sofyaningsih, M. (2020). Evaluation of nutrient content of chia flour (Salvia hispanica L.) and sesame flour (Sesamum indicum L.) as alternative flour rich in fiber and protein. *ARGIPA (Arsip Gizi dan Pangan), 5*(1), 27-33.

Bish, A., & Michie, S. (2010). Demographic and attitudinal determinants of protective behaviours during a pandemic: A review. *British journal of health psychology, 15*(4), 797-824.

Carr, A. C., & Rowe, S. (2020). The Emerging Role of Vitamin C in the Prevention and Treatment of COVID-19. In: Multidisciplinary Digital Publishing Institute.

Chan, M.-p. S., Winneg, K., Hawkins, L., Farhadloo, M., Jamieson, K. H., & Albarracín, D. (2018). Legacy and social media respectively influence risk perceptions and protective behaviors during emerging health threats: A multi-wave analysis of communications on Zika virus cases. *Social Science & Medicine, 212*, 50-59.

Correa, T., Reyes, M., Taillie, L. S., Corvalán, C., & Dillman Carpentier, F. (2020). Food advertising on television before and after a national unhealthy food marketing regulation in chile, 2016–2017. *American Journal of Public Health, 110*(7), 1054-1059.

Dryhurst, S., Schneider, C. R., Kerr, J., Freeman, A. L., Recchia, G., Van Der Bles, A. M., . . . van der Linden, S. *Journal of Risk Research,* (2020). Risk perceptions of COVID-19 around the world. *23*(7-8), 994-1006.

Grm, H. Š., Ars, M. S., Besednjak-Kocijančič, L., & Golja, P. (2012). Nutritional supplement use among Slovenian adolescents. *J Public health nutrition, 15*(4), 587-593.

Hamulka, J., Jeruszka-Bielak, M., Górnicka, M., Drywień, M. E., & Zielinska-Pukos, M. (2021). Dietary Supplements during COVID-19 Outbreak. Results of Google Trends Analysis Supported by PLifeCOVID-19 Online Studies. *Nutrients, 13*(1), 54.

Holford, P., Carr, A. C., Jovic, T. H., Ali, S. R., Whitaker, I. S., Marik, P. E., & Smith, A. D. J. N. (2020). Vitamin C—An Adjunctive Therapy for Respiratory Infection, Sepsis and COVID-19. *Nutrients, 12*(12), 3760.

Kantor, E. D., Rehm, C. D., Du, M., White, E., & Giovannucci, E. (2016). Trends in dietary supplement use among US adults from 1999-2012. *JAMA, 316*(14), 1464-1474.

Komite Penanganan Covid-19 dan Pemulihan Ekonomi Nasional. (2021). Situasi Covid-19 di Indonesia (Update 14 Februari 2021). Retrieved from https://covid19.go.id/berita/data-vaksinasi-covid-19-update-14-februari-2021

Kwan, D., Hirschkorn, K., & Boon, H. (2006). U.S. and Canadian pharmacists' attitudes, knowledge, and professional practice behaviors toward dietary supplements: a systematic review. *BMC Complementary and Alternative Medicine, 6*(1), 31. doi:10.1186/1472-6882-6-31

Mejia, C., Ticona, D., Rodriguez-Alarcon, J., Campos-Urbina, A., Catay-Medina, J., Porta-Quinto, T., . . . Ruiz Mamani, P. (2020). The Media and their Informative Role in the Face of the Coronavirus Disease 2019 (COVID-19): Validation of Fear Perception and Magnitude of the Issue (MED-COVID-19). *Electron J Gen Med. 2020, 17*(6)

Oh, S.-H., Lee, S. Y., & Han, C. (2020). The effects of social media use on preventive behaviors during infectious disease outbreaks: The mediating role of self-relevant emotions and public risk perception. *Health communication,* 1-10.

Pouchieu, C., Andreeva, V. A., Péneau, S., Kesse-Guyot, E., Lassale, C., Hercberg, S., & Touvier, M. (2013). Sociodemographic, lifestyle and dietary correlates of dietary supplement use in a large sample of French adults: results from the NutriNet-Sante cohort study. *British journal of nutrition, 110*(8), 1480-1491.

Sofyaningsih, M., & Arumsari, I. (2021). The Effect of Chia and Sesame Flour Substitution to Nutrient Content and Sensory Quality of Mini Croissant. *Jurnal Pangan dan Agroindustri, 9*(1), 34-43.

Vai, B., Cazzetta, S., Ghiglino, D., Parenti, L., Saibene, G., Toti, M., . . . Benedetti, F. (2020). Risk perception and media in shaping protective behaviors: insights from the early phase of COVID-19 Italian outbreak. *Frontiers in psychology, 11*.

Vatanparast, H., Adolphe, J. L., & Whiting, S. J. J. H. r. (2010). Socio-economic status and vitamin/mineral supplement use in Canada. *J Health reports, 21*(4), 19.

WHO. (2021). WHO Coronavirus Disease (COVID-19) Dashboard.

Wise, T., Zbozinek, T. D., Michelini, G., & Hagan, C. (2020). Changes in risk perception and protective behavior during the first week of the COVID-19 pandemic in the United States.

Zhang, S. X., Graf-Vlachy, L., Looi, K. H., Su, R., Li, J. (2020). Social media use as a predictor of handwashing during a pandemic: evidence from COVID-19 in Malaysia. *Epidemiology Infection, 148*.