

Determinants of Multivitamin Supplement Consumption in College Students During The Covid-19 Pandemic

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Submitted: 12/04/2022 **Revised:** 10/05/2023 **Accepted:** 12/09/2023 **Published online:** 29/10/2023

doi: <https://doi.org/10.35308/j-kesmas.v7i2.7568>. **How to cite this article:** Azizah, R., Syahrul, F., Saputra, F.F & Ssekalembe, G. (2023). Determinants of Multivitamin Supplement Consumption in College Students During The Covid-19 Pandemic, *J-Kesmas: Jurnal Fakultas Kesehatan Masyarakat (The Indonesian Journal of Public Health)*. 10(2): 97-104

Abstract

One of the areas affected by the Covid-19 pandemic is Sumenep Regency. The vulnerable population is adolescents. Preventive measures that can be taken to maintain exposure to Covid-19 are the consumption of multivitamin supplements. The purpose of this study was to analyze the determinants that affect the consumption of multivitamin supplements for students in Sumenep Regency during the Covid-19 pandemic. Type of quantitative research with Cross-Sectional study design. The sampling technique uses non probability sampling. The study was conducted online with a total of 300 respondents. The research was conducted online. The dependent variable is the consumption of multivitamin supplements. Independent variables are socio-demographic factors, social support and behavior in terms of planned behavior theory. The analysis was performed using multiple regression performed on SPSS 18. The determinant of multivitamin supplement consumption in students in Sumenep Regency is monthly income (aExp (B) 2,233; CI 1.152-4.329), information sources (aExp(B) 2.296; CI 1.091-4.833), residence category (aExp(B) 0.282; CI 0.080-0.989), knowledge (aExp(B) 2.843; CI 1,636-4,939), Family Emotional Support (aExp(B) 2,659; CI 1.422-4.971), Family Informational Support (aExp(B) 4.507; CI 1.824-11.135). It is important to always provide support to adolescents to regularly take multivitamin supplements in an effort to prevent the transmission of COVID-19

Keywords: Determinant Factors; Multivitamin Supplement; Consumption; College Students;

Introduction

The Covid-19 pandemic is one of the pandemics that occurred in the 21st century on a very large scale. The Covid-19 pandemic was first discovered in the Chinese city of Wuhan, then spread throughout the world (Chandrasekaran & Fernandes, 2020). The Covid-19 pandemic spread throughout the world very quickly with mutations that were also fast, causing high cases and deaths (Sorci et al., 2020).

The spread of Covid-19 in Indonesia until July 2021 reached >100 million confirmed cases using RT PCR. Most of the Covid-19 pandemic easily attacks lower-middle-income countries with high-density and poor health facilities (Sorci et al., 2020). One of the regions in Indonesia affected by Covid-19 is the Sumenep regency. The number of Covid-19 cases in Sumenep Regency reached 4589 cases with a case fatality rate of 5.5%. Sumenep Regency has a fairly high number of cases when compared to other districts on Madura Island even though it has a location at the

eastern end which is likely to have lower mobility compared to other districts (Dinas Kesehatan Jawa Timur, 2021).

One of the vulnerable populations is adolescents, adolescents have a high risk factor for exposure to Covid-19 because there is still a lack of understanding related to Covid-19 prevention and high stress due to limited activities that suddenly stop or are interrupted due to the Covid-19 pandemic (Natalia et al., 2020; Ruskandi, 2021).

Covid-19 can be prevented by using various ways, one of which is by increasing body immunity through the consumption of nutritious foods that can be supplemented by the consumption of additional vitamin supplements (Kamphuis et al., 2006). Although Covid-19 can heal independently when antibodies strengthen, the body needs to increase immunity through exercise, taking additional vitamin supplements, getting enough rest and avoiding stress (Aldwihi et al., 2021; Ioannou et al., 2020).

Social, emotional, concrete action, and information support are needed, especially in the situation of the Covid-19 outbreak that afflicts adolescents so that adolescents are expected to protect themselves from exposure to Covid-19 by taking multivitamin supplements to strengthen their immune system (Kundari et al., 2020). Students are one of the groups of adolescents who are also vulnerable to being affected by Covid-19. With such conditions, it is necessary to conduct research related to the determinants of supplement consumption in students in Sumenep Regency during the Covid-19 pandemic, so that students are expected to maintain their immunity independently during the Covid-19 pandemic so that it is expected to prevent students from being exposed to Covid-19, and to avoid the severity of Covid-19 disease. This study aims to analyze the determinants of multivitamin supplement consumption in students during the Covid-19 pandemic.

Methods

This research was conducted by paying attention to all components of ethical clearance and has obtained consent from respondents through an informed consent form. In addition, this research has received approval from the ethical institution of the University of Muhammadiyah Gresik with Number: 039/KET/II.3.UMG/KEP/A/2021 and is declared ethically feasible.

The study was conducted with quantitative design with cross sectional study design. The study population was students in Sumenep Regency. Data collection was carried out from October 2021 to March 2022. The sampling technique uses non probability sampling. Data collection is done using an e-form provided by Google. The number of respondents who filled out the questionnaire amounted to 321 people, but 21 people were excluded in the analysis due to incomplete data.

The dependent variable of this study is the consumption of multivitamin supplements, the independent variables of this study are socio-demographic factors (age, gender, parents' last education, monthly family income, parents' occupation), residence factors (location of residence, type of residence, distance to health facilities), social support (peer support and family support), individual factors reviewed using Theory Planned Behavior (TPB).

Socio-demographic variables consist of respondents' age expressed in years, respondents' gender expressed in men and women, the last education owned by respondents' parents

(elementary, junior high, high school and college), respondents' monthly family income (<2 million and \geq 2 million), respondents' parents' jobs (not working/unemployed, private employees, entrepreneurs, civil servants/army/Police/Teachers), type of residence (living with parents and living alone), location of residence (urban, rural).

Peer support variables were measured using questionnaires compiled by RAND (Widiyawati et al., 2021), The peer support questionnaire has 4 constructs of emotional and informational support, tangible support, affectionate support and positive social interaction. Family support variables were measured using a family support questionnaire compiled by Nursalam (2017) which had 4 constructs of emotional support, facility support, information support and reward support which were then modified according to the needs of researchers.

Individual factor variables reviewed using Theory Planned Behavior were measured using a questionnaire compiled by Ajzen consisting of 4 constructs including Attitude Toward Behavior, Subjective Norm, Perceived Behavioral Control, Intention which was then modified according to the needs of the researcher.

Univariable analysis is carried out by compiling a frequency distribution table based on the category of each variable. The table is presented in the form of a crosstab between the dependent variable and the independent variable. Bivariable analysis is performed for variable selection in multivariable analysis. Data analysis by calculating the value of OR (odds ratio) to see the strength of the relationship between the dependent variable and the independent variable.

Results

The results of the analysis that have been carried out show that all respondents who participated in the study had an average age of 20.7 with a minimum age of 16 years and a maximum age of 29 years. Women have a higher proportion of supplement consumption when compared to male respondents. The last educational variable of parents showed that most of the respondents' parents were high school graduates, followed by college graduates, both Diploma and undergraduate and postgraduate graduates. While the respondents' parents' jobs partly have jobs as Entrepreneurs/Traders/Farmers/Fishermen, which are then followed by civil servants/TNI/Polri with considerable differences. The monthly income of respondents' families mostly has a monthly income of < 2 million, which is directly proportional to MSEs in

Sumenep Regency which are indeed below 2 million.

The source of information that is the main source of respondents in accessing information related to Covid-19 is sourced from the internet, besides that some respondents also use information sources from health workers, but there are only a few respondents who use TV and Leaflets related to multivitamin supplements as a source of information.

Most respondents live in rural areas, there is only a small percentage of respondents who live in urban areas. Respondents who participated in the study mostly lived together with parents and there was only a small percentage who lived alone. The average distance between the respondent's residence and health facilities such as hospitals, puskesmas and

pharmacies is 4.0 kilometers with the farthest distance being 15 kilometers. Most respondents have good knowledge related to multivitamin consumption during the Covid-19 pandemic, but respondents who have a bad level of knowledge are still higher when compared to respondents who have good knowledge about Covid-19.

Family monthly income (exp (B) 2,272; CI 1345-3.840), information sources (exp(B) 2.469; CI 1.336-4.563), residential category,(exp(B) 0.318; CI 0.108-0.940) and knowledge (exp(B) 2.486; CI 1.602-3.858) is a candidate for multivariate analysis because the value of 95% CI does not cross 1.

Table 1. Socio-Demographic Characteristics

Variable	Multivitamin Consumption				Total	Exp	Lower	Upper	
	Yes	%	No	%					
Age	Mean = 20.7 years; Min = 16 years; Max = 29 years					1.347	1.200	1.513	
Sex	Female	119	68.0	56	32.0	175	1.163	0.705	1.920
	Male	89	71.2	36	28.8	125			
Parents' Last Education	Elementary	35	56.5	27	43.5	62	1.137	0.906	1.428
	Junior High School	19	73.1	7	26.9	26			
	Senior High School	102	79.1	27	20.9	129			
	College	52	62.7	31	37.3	83			
Employment Status Of Parents	Unemployed	11	61.1	7	38.9	18	1.199	0.906	1.586
	Entrepreneurs, Traders, Farmers, Fishermen	114	65.9	59	34.1	173			
	Private Employees	37	86.0	6	14.0	43			
Household Income	Civil Servant/Army/Police	20	30.3	46	69.7	66	2.272	1.345	3.840
	<2 Million	107	62.2	65	37.8	172			
	≥2 Million	101	78.9	27	21.1	128			
Multivitamin Resources	Leaflet/Brochure	0	0	3	100	3	2.469	1.336	4.563
	TV	9	75.0	3	25.0	12			
	Internet	166	66.9	82	33.1	248			
Residence	Health Worker	33	89.2	4	10.8	37	1.055	0.623	1.787
	Rural	140	69.0	63	31.0	203			
Type Of Residence	Urban	68	70.1	29	29.9	97	0.318	0.108	0.940
	Living With Parents	182	67.4	88	32.6	270			
Distance To Health Facilities	Living Alone	26	86.7	4	13.3	30	0.999	0.933	1.069
	Mean = 4.0 Km; Min = 0.1 Km; Max = 15 Km								
Knowledge of Covid-19	Good	39	54.4	34	46.6	73	2.486	1.602	3.858
	Enough	132	71.0	54	29.0	186			
	Bad	37	90.2	4	9.8	41			

(Primary Data, 2022)

Table 2. Family Support Characteristics

Variable	Multivitamin Consumption				Total	Exp	Lower	Upper	
	Yes	%	No	%					
Family Emotional Support	Bad	24	61.5	15	38.5	39	2.084	1.374	3.160
	Enough	112	62.9	66	37.1	178			
	Good	72	86.7	11	13.3	83			
Family Facility Support	Bad	34	57.6	25	42.4	59	1.588	1.142	2.206



Family Support	Informational	Enough	79	66.9	39	33.1	118	2.317	1.616	3.323
		Good	95	77.2	28	22.8	123			
		Bad	20	37.0	34	63.0	54			
Family Reward Support		Enough	100	75.2	33	24.8	133	2.343	1.548	3.547
		Good	88	77.9	25	22.1	113			
		Bad	42	58.3	30	41.7	72			
		Enough	116	66.3	59	33.7	175			
		Good	50	94.3	3	5.7	53			

(Primary Data, 2022)

The family support received by respondents related to the consumption of multivitamin supplements was generally sufficient. The results of the analysis of each form of family support were Family Emotional Support (exp (B) 2,084; CI 1.374-3.160), Family Informational Support (exp(B) 2.317; CI 1.616-3.323) and Family Reward Support (exp(B) 2.343; CI 1,548-3,547) received by respondents from families was mostly sufficient, but in contrast to Family Facility Support received by respondents where some respondents received good Family Facility Support from families (exp (B) 1,588; CI 1.422-2.206). All family support variables were candidates for

multivariate analysis.

The peer support respondents received related to the consumption of multivitamin supplements was generally sufficient. Results of Emotional Support analysis (exp (B) 1,713; CI 1.136-2.582), affectionate Support (exp(B) 1.024; CI 0.722-1.451) and Positive Social Interaction (exp(B) 0.991; CI 0.627-1.564) received by respondents from peers is mostly sufficient, but in contrast to Tangible Support received by respondents where most respondents lack tangible support from peers (exp (B) 2.017; CI 1.341-3.036). Emotional support and tangible support are candidates for multivariate analysis.

Table 3. Peer Support Characteristics

Variable		Multivitamin Consumption				Total	Exp	Lower	Upper
		Yes	%	No	%				
Emotional Support	Bad	62	60.2	41	39.8	103	1.713	1.136	2.582
	Enough	121	72.9	45	27.1	166			
	Good	25	80.6	6	19.4	31			
Tangible Support	Bad	86	60.6	56	39.4	142	2.017	1.341	3.036
	Enough	94	74.6	32	25.4	126			
	Good	28	87.5	4	12.5	32			
Affectionate Support	Bad	47	73.4	17	26.6	64	1.024	0.722	1.451
	Enough	98	65.3	52	34.7	150			
	Good	63	73.3	23	26.7	86			
Positive Social Interaction	Bad	7	63.6	4	36.4	11	0.991	0.627	1.564
	Enough	129	70.1	55	29.9	184			
	Good	72	68.6	33	31.4	105			

(Primary Data, 2022)

The behavioral characteristics of respondents are seen using the Theory of Planned Behavior (TPB). construct Attitude Towards Behavior most respondents were sufficient (exp (B) 1,789; CI 1.1099-2.911) and is a candidate for multivariate analysis because the OR does not pass the value of 1. Subjective Norm construct (exp (B) 0.844; CI 0.474-1.502), Perceived Behavioral Control respondents can

mostly be categorized as good (exp(B) 0.743; CI 0.464-1.192), respondents' intention was largely sufficient to mean that respondents' intention to take multivitamin supplements was sufficient with a value of (exp (B) 1.454; CI 0.938-2.252). However, the results showed that subjective norm, perceived behavioral control and intention were not candidates for multivariate analysis.

Table 4. Individual Characteristic

Variable		Multivitamin Consumption				Total	Exp	Lower	Upper
		Yes	%	No	%				
Attitude Towards Behavior	Bad	10	62.5	6	37.5	16	1.789	1.099	2.911
	Enough	133	65.5	70	34.5	203			
	Good	65	80.2	16	19.8	81			
Subjective Norm	Bad	0	0.0	0	0.0	0	0.844	0.474	1.502
	Enough	54	72.0	21	28.0	75			



Perceived Behavioral Control	Good	154	68.4	71	31.6	225	0.743	0.464	1.192
	Bad	7	77.8	2	22.2	9			
	Enough	69	73.4	25	26.6	94			
Intention	Good	132	67.0	65	33.0	197	1.454	0.938	2.252
	Bad	9	64.3	5	35.7	14			
	Enough	111	65.7	58	34.3	169			
	Good	88	75.2	29	24.8	117			

(Primary Data, 2022)

The results of the selection analysis that have been carried out show the results of several variables that passed the selection test and continued to be carried out multivariate analysis. The results of the multivariate test analysis conducted showed that there were 11 variables that were significant to the consumption of multivitamin supplements, namely family monthly income, information sources, categories of residence, knowledge, social support factors derived from family (family emotional support, family facility support, family informational support, family reward support), peer social support (emotional support, tangible support), and individual behavioral factors, namely attitude towards behavior. The results of the analysis that have been carried out show that the adjusted value of Nagelkerke R² is 34%, this shows that the independent variable can explain the incidence of the dependent variable, namely the consumption of multivitamin supplements by 34% and the rest is explained by other variables outside the research variable.

Table 5. Multivariate Analysis

Variable	aExp (B)	CI	
		Lower	Upper
Household Income*	2.233	1.152	4.329
Multivitamin Resources *	2.296	1.091	4.833
Type of Residence*	0.282	0.080	0.989
Knowledge of Covid-19*	2.843	1.636	4.939
Family Emotional Support*	2.659	1.422	4.971
Family Facility Support	0.904	0.443	1.844
Family Informational Support*	4.507	1.824	11.135
Family Reward Support	1.846	0.876	3.890
Peer Emotional Support	2.085	0.936	4.644
Peer Tangible Support	2.120	0.905	4.967
Attitude Towards Behavior	1.492	0.806	2.765

Constanta = -2.615; adjusted Nagelkerke R² = 0.340 (Primary Data, 2022).

Respondents with a monthly family income of ≥ 2

million rupiah were 2,233 times more likely to take multivitamin supplements (aExp (B) 2,233; CI 1,152-4,329) compared to respondents who had a monthly income of < 2 million rupiah. Respondents who received information sources related to multivitamin consumption from health workers were 2 times more likely (aExp (B) 2,296; CI 1,091-4,833) when compared to respondents who obtained information from other sources. Respondents belonging to the residence category who lived with parents were 0.282 times more likely (aExp(B) 0.282; CI 0.080-0.989) for taking multivitamin supplements compared to respondents who lived alone (boarding house). Respondents who had good knowledge related to the consumption of multivitamin supplements had a 2 times greater chance (aExp (B) 2,843; CI 1,636-4,939) for taking multivitamin supplements compared to respondents who had poor knowledge.

Respondents who received emotional support from family were 2 times more likely to take multivitamin supplements (aExp (B) 2,659; CI 1,422-4,971) when compared to respondents who did not get emotional support from family. Respondents who received informed support from family were 4 times more likely to take multivitamin supplements (exp (B) 4,507; CI 1,824-11,135) when compared to respondents who did not receive information support from family.

Discussion

The results of the analysis that have been carried out show that most respondents consume regularly or have taken multivitamin supplements during the Covid-19 pandemic. Most respondents take multivitamin supplements regularly every day according to drinking rules, but there are a small number of respondents who take multivitamin supplements not routinely even not in accordance with drinking rules. Similar research results were found in a study conducted by Alfawaz et al. (2017) where most of the study respondents took multivitamin supplements and agreed that taking multivitamin supplements had good benefits for them.

There are various variants of multivitamins consumed by respondents ranging from vitamin C, Vitamin D and multivitamins that contain various vitamins and minerals. Research conducted by Brown



(2017) states that vitamins A and D have enormous advantages, especially in populations that are vulnerable to exposure to Covid-19, one of which is adolescents with high activity and interaction with various groups. In addition, selenium and zinc also have a vital role to be modulators for the body's immune system in preventing respiratory tract infections (Lieberman et al., 2015).

The Covid-19 pandemic has caused a very wide impact, including the impact on the economic sector (Aiswarya & Bhagya, 2021). During the Covid-19 pandemic, multivitamin supplements have a significant price increase making it difficult for the public to buy, this is exacerbated by the availability of stock in the market which is depleted due to panic buying by the public. The results of the analysis that have been conducted show that the monthly income of the family has the opportunity to take multivitamin supplements. Similar research results were found in a study conducted by Kaya, Uzdil, and Cakiroğlu (2021) stated that respondents who have income above the minimum wage tend to be able to consume nutrients better from food and from additional multivitamin supplements.

The results of research that have been conducted show that there are several sources of information that respondents use as a reference before taking multivitamin supplements. The most frequently used source of information by respondents comes from the internet. The internet is used as the most main source because of the easy access by respondents due to the evenly distributed internet network and adequate devices, the main source that is often used is television and then followed by health workers. However, the results of the analysis that have been carried out show that health workers are the source of information that has the greatest influence on respondents so that it becomes the main influence of respondents to take multivitamin supplements. Similar research results were found in a study conducted by Lidia et al. (2020) where health education conducted by health workers can increase the consumption of multivitamin supplements carried out by the community. This is because people still have confidence that the advice or education given by health workers must be correct so that the advice given by health workers both by doctors, nurses, pharmacists, and other health workers can be accepted and applied.

The results of the analysis showed that respondents who had a good level of knowledge about multivitamin supplements tended to take multivitamin supplements during the Covid-19 pandemic. Similar research results were also found in research conducted by Mukti (2020) which stated that the better the knowledge possessed by the public will affect the

level of consumption of multivitamin supplements consumed. Similar research results were also found in research conducted by (Prasetyaningtyas et al., 2020) where respondents' knowledge had an influence on the level of consumption of multivitamin supplements during the Covid-19 pandemic. Knowledge is one of the important components behind the consumption of multivitamin supplements in adolescents during the Covid-19 pandemic. Before the Covid-19 pandemic took place, not many people were aware of the function of taking multivitamin supplements and most adolescents only knew the function of multivitamin supplements only to help healing and for certain dietary patterns (Bagheri et al., 2020) However, since the Covid-19 pandemic took place, many sources of information have provided additional knowledge to adolescents regarding the function of taking multivitamin supplements, thereby increasing their knowledge and consumption of multivitamin supplements. There are several important knowledge that must be mastered by the public before taking multivitamin supplements, namely types, indications, dosages, side effects, drinking rules, and contra indications (Mukti, 2020).

Analysis has shown that family support is one of the determinants of multivitamin supplement consumption. Family support has 4 constructs namely informational, facilitative, emotional and reward support. Family support is help, encouragement by the family towards its members where the support as a mediator variable that indicates coping facilities during times of crisis (Craig et al., 2014). Family support can have a positive influence on the health of family members. This form of support can be provided in two ways, namely directly and indirectly. Directly this support will be able to encourage its members to behave healthily, while indirectly the support received from others will reduce tension or depression so as not to cause interference. Similar research results were found in research conducted by Antari et al. (2021) stating that the support provided by families affects the consumption of multivitamin supplements during the Covid-19 pandemic. Similar research results were also found in research conducted by Riskitasari, Kasiati, and Fatmaningrum (2021) stating that family is one of the driving factors for taking multivitamin supplements.

Conclusion

Research that has been conducted has shown that there are several factors related to the consumption of multivitamin supplements conducted by students in Sumenep Regency, ranging from factors such as family monthly income, sources of information, categories of residence, knowledge, support provided

by families including family emotional support, family informational support. For local governments, especially the Sumenep Regency government, it is necessary to educate families and students regarding the importance of taking multivitamin supplements because after all, the level of consumption of multivitamin supplements in Sumenep Regency is still quite low so it is hoped that the community, especially students, understand and have awareness independently to improve their health in the Covid-19 pandemic through the consumption of multivitamin supplements.

Acknowledgment

Thank you submitted to the various parties who have helped the preparation of the journal and the implementation of the research, especially the Health Academy of Sumenep

Author Contribution and Competing Interest

All authors contributed to article writing.

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