



Original Research

Knowledge, Attitude, and Perception of Youth Population in Indonesia toward COVID-19 Vaccination

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ARTICLE HISTORY

Received: 3 November 2022

Revised: 20 December 2022

Accepted: 15 Januari 2023

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KEYWORD

COVID-19 Vaccines; Adolescent; Knowledge; Attitude; Perceptions



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ABSTRACT

Introduction: COVID-19 vaccination acceptance by the youth population is still a major problem. Community vaccination programs are needed to immediately achieve immunity so that the goals of good health and well-being can be achieved. This study aims to identify the factors that influence vaccine acceptance in a group of youth non-health professionals.

Material and Methods: This cross-sectional, observational questionnaire-based study was conducted among 194 individuals in the age range of 18 to 25 years through online questionnaires. Data was collected using snowball sampling techniques collect data from respondents about their socio-demographics, knowledge, attitudes, and perceptions (KAP). Statistical used descriptive and analytical calculations (Chi-square and Mann-Whitney test).

Results: There was a correlation between occupation, comorbid status, and history of COVID-19 with vaccination acceptance. The average score of knowledge among the non-vaccinated group versus the vaccinated group were 52.13 ± 14.556 and 53.68 ± 13.843 (out of 70), respectively ($p = 0.509$), while the average score for attitude was 6.76 ± 1.781 and 7.44 ± 1.220 (out of 8) respectively ($p = 0.004$). The occupation, comorbid status, history of COVID-19, perception of dangerous side effects, and willingness to pay were associated with COVID-19 vaccination acceptance.

Conclusion: The vaccinated group showed a more positive attitude, though their average knowledge score was not significantly different with the unvaccinated group. Massive health promotion regarding COVID-19 vaccine safety, reassuring the population, especially the unemployed population and COVID-19 survivors should be taken by policymakers to ensure adequate knowledge, positive attitudes, and perceptions against COVID-19 vaccination.

Cite this as: Nurfaizi A, Afgriyuspita LS, Suasti NMA, Muttaqin UI, Azizah BN, Syahraya I, et al. (2023) Knowledge, Attitude, and Perception of Youth Population in Indonesia toward COVID-19 Vaccination. *Asian J Heal Res.* 2 (1): 13–21. doi: <https://doi.org/10.55561/ajhr.v2i1.63>

INTRODUCTION

Coronavirus Disease (COVID-19) pandemic is still a significant problem in Indonesia and almost all over the world. World Health Organization (WHO) reported there were 190,597,409 confirmed cases of COVID-19 and 4,093,145 deaths globally recorded. Indonesia detected the first case of COVID-19 on March 02 2020, and a total of 2,911,733 confirmed cases and 74,920 cumulative deaths were reported till July 19 2021 [1]. Indonesia's ministry of health has made many efforts to

control the spread of SARS-CoV-2 and minimize its impact. One of them is a vaccination program. Vaccines play an essential role in the eradication and control of many infectious diseases. The implementation of community vaccination programs is needed to immediately achieve immunity so that the goals of good health and well-being can be achieved [2].

Indonesia will be implementing several types of vaccines namely Sinovac, Oxford-Astrazeneca, Sinopharm, Moderna, Pfizer-BioNTech, and Novavax. The vaccination program in Indonesia is divided into

several stages based on priorities. The first stage is health workers, followed by the elderly, public workers, vulnerable communities, and the last stage target is the community with a cluster approach according to vaccine availability [3].

However, WHO detected doubts among citizens regarding vaccination acceptance due to several factors. Vaccine acceptance was positively associated with knowledge, fear regarding COVID-19, higher income, younger age, and testing negative for COVID-19 [4]. Based on the survey, people who do not want to receive the COVID-19 vaccine include groups of non-health workers, individuals who feel they have a low risk of being exposed to the SARS-CoV-2 virus, individuals at a young age and the development of this vaccine are considered too hasty [5]. Information also influences the acceptance of the COVID-19 vaccine [2].

To identify the factors that influence vaccine acceptance in a group of youth non-health professionals as the government vaccination target when this research was conducted, we need to know the socio-demographics, knowledge, attitudes, and perception toward COVID-19 vaccination in this group. Through this study, additional insight into these factors may contribute to implementing Indonesia's most effective vaccination strategy.

MATERIAL AND METHODS

Participant and Procedure

This study has received ethical clearance from the Ethics Committee of the Faculty of Medicine, Universitas Airlangga. This cross-sectional, observational questionnaire-based study was conducted in Indonesia on July 06-07, 2021. The study used online questionnaires to collect data from individuals in the age range of 18 to 25 years old about their Knowledge, Attitudes, and Perceptions (KAP) regarding the COVID-19 vaccine. Respondents were included in the study: those who have not received and those who have received COVID-19 vaccination. The inclusion criteria include 18-25 years old, not a student/worker/graduate in the health sector, and being willing to be a respondent.

Data was collected using snowball sampling techniques on the target population. The questionnaires were distributed on social media such as Whatsapp, LINE, Instagram and Twitter. The link to the questionnaire was shared with the application and social media sites listed. The research instrument used in this study was a questionnaire compiled based on the KAP protocol (Knowledge, Attitude, Perception). The questions were adapted from various research sources, including from Islam *et al.* [6] and Elhadi *et al.* [7], and modified by authors. The respondent's identity and answers are confidential. All respondents filled out the

questionnaire after reading and agreeing to the informed consent.

Measures

The questionnaire consisted of four sections. The first section included the socio-demographic characteristics; gender, age, occupation, religion, location, educational background, marital status, monthly income, comorbid status, and the status of being infected with COVID-19. The second section included respondents' knowledge towards the COVID-19 vaccine. This section consists of 7 statements; "Vaccination aims to actively generate or increase a person's immunity against a disease so that if one day they are exposed to the disease, they will not get sick or only experience mild illness and will not become a source of transmission.", "Vaccination will help achieve herd immunity", "The 5M protocol does not need to be applied if you have already received the COVID-19 vaccine", "The COVID-19 vaccine in Indonesia is given 3 doses", "People who have confirmed COVID-19 can be given the COVID-19 vaccine after recovering", "COVID-19 vaccine provides 100% immunity against COVID-19", "Post-immunization adverse events or KUPI are all medical events that occur after immunization, are of concern and are suspected to be related to immunization." with the answer choices are "True", "False" and "Don't know". Each correct answer gets a score of 10. The total score was obtained by summing the raw scores of seven items and ranged from 0 to 70, with the higher score indicating a greater level of knowledge towards the COVID-19 vaccine.

The third section included respondents' attitudes towards the COVID-19 vaccine. The third section consists of 4 statements; "In my opinion, the COVID-19 vaccine is safe to use.", "In my opinion, the COVID-19 vaccine is important for youth group", "I will encourage my family/friends/relatives to get vaccinated", "I am willing to be vaccinated against COVID-19 without a doubt" with the response of each item was indicated on a three-point Likert scale (i.e., 0 = Disagree, 1 = Undecided, and 2 = Agree). The total score was calculated by summarising the raw scores of the four items ranging from 0 to 8, with an overall greater score indicating more positive attitudes towards COVID-19 vaccine. The last section included respondent's perception towards COVID-19 vaccine, and consists of 5 questions; "Do you think the COVID-19 vaccine have dangerous side effects?", "Do you think the COVID-19 vaccine will be effective in preventing COVID-19 infection?", "Do you think that the COVID-19 pandemic can be eradicated without vaccination if the community adheres to the preventive measures?", "Who do you think should receive the COVID-19 vaccine?", "Are you willing to pay to receive the COVID-19 vaccine?" with the answer choices are

Table 1. Socio-Demographic Characteristics

Variables	Total		Not Yet Vaccinated		Vaccinated at least One Dose		p-value
	n	%	n	%	n	%	
Gender							
Male	77	39.7	28	35.0	49	43.0	0.263
Female	117	60.3	52	65.0	65	57.0	
Age							
18 – 21 years	55	28.4	22	27.5	33	28.9	0.826
22 – 25 years	139	71.6	58	72.5	81	71.1	
Occupation							
Student	98	50.5	43	53.8	55	48.2	0.009
Employed	75	38.7	23	28.7	52	45.6	
Not employed	21	10.8	14	17.5	7	6.1	
Religion							
Islam	177	91.2	75	93.8	102	89.5	0.966*
Hindu	10	5.2	3	3.8	7	6.1	
Catholic	3	1.5	1	1.3	2	1.8	
Protesant	2	1.0	1	1.3	1	0.9	
Buddha	1	0.5	0	0	1	0.9	
Konghucu	1	0.5	0	0	1	0.9	
Location							
East Java	111	57.2	52	65.0	59	51.8	0.143*
DKI Jakarta	21	10.8	8	10.0	13	11.4	
West Nusa Tenggara	16	8.2	7	8.8	9	7.9	
Bali	10	5.2	4	5.0	6	5.3	
Central Java	10	5.2	4	5.0	6	5.3	
West Java	21	10.8	3	3.8	18	15.8	
Banten	1	0.5	0	0.0	1	0.9	
Yogyakarta	1	0.5	1	1.3	0	0.0	
Aceh	1	0.5	1	1.3	0	0.0	
South Kalimantan	1	0.5	0	0.0	1	0.9	
South Sulawesi	1	0.5	0	0.0	1	0.9	
Educational Background							
Undergraduate	122	62.9	45	56.3	77	67.5	0.111*
Senior High School	71	36.6	34	42.5	37	32.5	
Junior High School	1	0.5	1	1.3	0	0.0	
Marital Status							
Single	192	99.0	79	98.8	113	99.1	1,000*
Married	2	1.0	1	1.3	1	0.9	
Monthly Income							
Unemployed	89	45.9	42	52.5	47	41.2	0.091*
< IDR 500,000	14	7.2	6	7.5	8	7.0	
IDR 500,000 – IDR 1,000,000	14	7.2	9	11.3	5	4.4	
IDR 1,000,000 – IDR 2,000,000	19	9.8	8	10.0	11	9.6	
IDR 2,000,000 – IDR 5,000,000	31	16.0	9	11.3	22	19.3	
IDR 5,000,000 – IDR 10,000,000	24	12.4	5	6.3	19	16.7	
IDR 10,000,000 – IDR 20,000,000	2	10.0	1	1.3	1	0.9	
> IDR 20,000,000	1	0.5	0	0.0	1	0.9	
Comorbid Status							
No	177	91.2	68	85	109	95.6	0.010
Yes	17	8.8	12	15	5	4.4	
Infected with COVID-19							
No	162	83.5	60	75	102	89.5	0.007
Yes	32	16.5	20	25	12	10.5	

* Fisher's Exact Test

“Yes”, “No” and “Maybe”, except for the question “Who do you think should receive the COVID-19 vaccine?” provides answer choices “Everyone”, “People infected with COVID-19”, “After recovering from COVID-19” and “People who have never had COVID-19 infections”.

Statistical Analysis

The data were analyzed using Microsoft Office Excel 2019 and SPSS 25 version. The collected data

were presented in tables and narratives. Quantitative data were shown as mean and standard deviation (SD). Numerical values were expressed in n = numbers and shown as percentage (%), mean and SD, while non-numerical values were expressed as frequency and percentage. Statistical analysis used descriptive and analytical calculations (Chi-square and Mann-Whitney test). A p-value less than 0.05 was taken to be statistically significant.

Minimize Bias

To minimize potential bias, we used a wide range of distribution channels. The respondent’s identity and answers were also ensured confidential. The questionnaire was designed into four sections and required an estimated 5-10 minutes to complete to reduce survey fatigue [8]. We also did an online webinar and worked with external partner ‘Komunitas Surabaya Memanggil’ about the need for COVID-19 vaccination for the youth population and how to get COVID-19 vaccine in the final part of our research.

The respondents were offered to join our free online webinar in the last questionnaire. Hopefully, this project could help policymakers ensure adequate knowledge, attitudes, and positive perceptions against COVID-19 vaccination, reduce vaccine hesitancy and facilitate the respondents regarding the schedule and procedure for obtaining the COVID-19 vaccine.

RESULTS

Socio-Demographic Characteristics

The study involved a total of 194 respondents. 77 participants (39.7 %) were males and 117 (60.3%) were females. The majority of respondents were in the age range of 22-25 years (71.6%), 98 respondents (50.5%) were students, 177 respondents (91.2%) were Muslim, 111 respondents (57.2%) lived in the East Java province, 122 respondents (62.9%) had an undergraduate degree, and 192 respondents (99%) was not married. Statistical analyses using the Chi-Square Test showed there was

correlation between occupation, comorbid status, and history of COVID-19 infection and COVID-19 vaccination acceptance (p-value < 0.05) (Table 1).

Knowledge towards COVID-19 Vaccine

Data regarding respondents' knowledge are presented in Table 2. The average score of respondents who have not received vaccination was 52.13 ± 14.556, while the average knowledge score of respondents who have received vaccination was 53.68 ± 13.843. However, statistical analysis using the Mann-Whitney test revealed no significant difference between them (p-value > 0.05), despite the fact that respondents who received vaccinations showed higher knowledge.

Attitude towards COVID-19 Vaccine

The distribution of each of the attitude item towards the COVID-19 vaccine is presented in Table 3. The average attitude score for non-vaccinated respondents was 6.76 ± 1.781, while the average attitude score for vaccinated respondents was 7.44 ± 1.220. Although both respondents demonstrated positive attitudes towards the vaccine, statistical analysis using the Mann-Whitney test revealed a significant difference between them (p-value < 0.05).

Perception towards COVID-19 Vaccine

The distribution of each perception item about the COVID-19 vaccine is presented in Table 4. Most non-vaccinated respondents believed that COVID-19 vaccination might have dangerous side effects, 35 respondents (43.8%) believed that vaccination might be

Table 2. Knowledge towards COVID-19 Vaccine

Statement	Not Yet Vaccinated (n=80)			Vaccinated at Least One Dose (n=114)			p-value
	True n (%)	False n (%)	Don't Know n (%)	True n (%)	False n (%)	Don't Know n (%)	
1	65 (81.3)	8 (10.0)	7 (8.8)	94 (82.5)	9 (7.9)	11 (9.6)	0.509*
2	65 (81.3)	2 (2.5)	13 (16.3)	95 (83.3)	4 (3.5)	15(13.2)	
3	71 (88.8)	5 (6.3)	4 (5.0)	97 (85.1)	14 (12.3)	3 (2.6)	
4	60 (75.0)	5 (6.3)	15 (18.8)	99 (86.8)	2 (1.8)	13 (11.4)	
5	49 (61.3)	14 (17.5)	17 (21.3)	80 (70.2)	13 (11.4)	21 (18.4)	
6	68 (85.0)	3 (3.8)	9 (11.3)	91 (79.8)	5 (4.4)	18 (15.8)	
7	39 (48.8)	3 (3.8)	38 (47.5)	56 (49.1)	7 (6.1)	51 (44.7)	
Score (Max = 70) (Mean ± SD)	52.13 ± 14.556			53.68 ± 13.843			

*Mann-Whitney

(Statement 1: “Vaccination aims to actively generate or increase a person's immunity against a disease, so that if one day they are exposed to the disease, they will not get sick or only experience mild illness and will not become a source of transmission.”, Statement 2: “Vaccination will help achieve herd immunity”, Statement 3: “The 5M protocol does not need to be applied if you have already received the COVID-19 vaccine”, Statement 4: “The COVID-19 vaccine in Indonesia is given 3 dose”, Statement 5: “People who have confirmed COVID-19 can be given the COVID-19 vaccine after recovering COVID-19”, Statement 6: vaccine provides 100% immunity against COVID-19”, Statement 7: “Post-immunization adverse events or KIPI are all medical events that occur after immunization, are of concern and are suspected to be related to immunization.”)

Table 3. Attitude towards COVID-19 Vaccine

Statement	Not Yet Vaccinated (N=80)			Vaccinated at Least One Dose (n=114)			p-value
	Agree n (%)	Undecided n (%)	Disagree n (%)	Agree n (%)	Undecided n (%)	Disagree n (%)	
1	58 (72.5)	20 (25.0)	2 (2.5)	100 (87.7)	12 (10.5)	2 (1.8)	0.004*
2	60 (75.0)	14 (17.5)	6 (7.5)	100 (87.7)	7 (6.1)	7 (6.1)	
3	59 (73.8)	18 (22.5)	3 (3.8)	102 (89.5)	10 (8.8)	2 (1.8)	
4	59 (73.8)	17 (21.3)	4 (5.0)	105 (92.1)	5 (4.4)	4 (3.5)	
Score (Max = 8) (Mean ± SD)	6.76 ± 1.781			7.44 ± 1.220			

*Mann-Whitney

(Statement 1: “In my opinion, the COVID-19 vaccine is safe to use.”, Statement 2: “In my opinion, the COVID-19 vaccine is important for youth group”, Statement 3: “I will encourage my family/friends/relatives to get vaccinated”, Statement 4: “I am willing to be vaccinated against COVID-19 without a doubt”)

Table 4. Perception Towards COVID-19 Vaccine

Question	Not Yet Vaccinated (n=80)	Vaccinated At Least One Dose (n=114)	p-value
	n (%)	n (%)	
Do you think the COVID-19 vaccine have dangerous side effects?			0.000
Yes	6 (7.5)	7 (6.1)	
No	24 (30.0)	75 (65.8)	
Maybe	50 (62.5)	32 (28.1)	
Do you think the COVID-19 vaccine will be effective in preventing COVID-19 infection?			0.058
Yes	32 (40.0)	63 (55.3)	
No	13 (16.3)	9 (7.9)	
Maybe	35 (43.8)	42 (36.8)	
Do you think that the COVID-19 pandemic can be eradicated without vaccination if the community adheres to preventive measures?			0.421
Yes	24 (30.0)	25 (21.9)	
No	28 (35.0)	47 (41.2)	
Maybe	28 (35.0)	42 (36.8)	
Who do you think should receive the COVID-19 vaccine?			0.328*
Everyone	61 (76.3)	96 (84.2)	
People infected with COVID-19	16 (20.0)	14 (12.3)	
After recovering from COVID-19	2 (2.5)	1 (0.9)	
People who have never had COVID-19	1 (1.3)	3 (2.6)	
Are you willing to pay to receive the COVID-19 vaccine?			0.005
Yes	19 (23.8)	53 (46.5)	
No	32 (40.0)	29 (25.4)	
Maybe	29 (36.3)	32 (28.1)	

*Fisher's Exact Test

effective in preventing COVID-19 infection, 28 respondents (35%) claimed to abide by preventive protocols could resolve the pandemic without vaccination, 61 respondents (76.3%) believed that COVID-19 vaccination needs to be received by everyone, and 32 respondents (40%) was not willing to pay for the vaccine. Respondents who had been vaccinated believed that COVID-19 vaccination was not harmful to the body (55.3%), 47 people believed complying with preventive protocols could not solve the pandemic without vaccination (41.2%), 96 respondents agreed that COVID-19 vaccination needs to be received

by everyone (84.2%), 53 respondents were willing to pay to be vaccinated (46.5%). The statistical test using the Chi-Square showed that perception related to dangerous side effects and willingness to pay for COVID-19 vaccination were associated with vaccination acceptance.

DISCUSSION

We decided to investigate the knowledge, attitudes, and perceptions of both unvaccinated and vaccinated youth group (18-25 years). This age group tends to have

higher mobility and is more susceptible to exposure to the SARS-CoV-2 virus [4,9]. In addition, most youths use social media (WhatsApp, Instagram, Twitter, etc). However, many irresponsible accounts still spread false information about COVID-19. We hope that this research can assist the government in evaluating the awareness and provide education to them to be willing to receive the COVID-19 vaccine and increase vaccination coverage in Indonesia. High and even vaccination coverage can form herd immunity, which can prevent the transmission of an infectious disease within a particular group and even break the chain of transmission [10].

Based on socio-demographic characteristics, it was found that occupation, comorbidities, and history of COVID-19 had a significant relationship with vaccination status. Most respondents who have been vaccinated were students and workers. This was probably because several institutions or agencies require students and their employees to receive vaccines. In addition, it was also in accordance with the stages of vaccination in Indonesia. The first stage was for all health workers, the second stage was for the elderly and public workers, the third stage was for vulnerable communities in terms of geospatial, social and economic aspects, and the last stage was for the target community and economic actor's others with a cluster approach according to the availability of vaccines [11].

Most respondents who have been vaccinated have no comorbidities, while five respondents have comorbidities in the form of hypertension, diabetes and controlled asthma or allergies. Respondents who have most comorbidities have not been vaccinated. It is possible that the type of comorbidity causes vaccine administration to be delayed or is a contraindication to vaccine administration, for example, individuals with previous severe allergic reactions to the vaccine (e.g., acute anaphylaxis, angioedema, dyspnea) [12]; individuals who have experienced significant venous and arterial thrombosis with thrombocytopenia following vaccination with any vaccine.

The comorbidities of respondents who have not received the vaccine include allergies or uncontrolled asthma, hypertension, diabetes and one person suffering from Giant-Cell Tumour of bone (GCT) and Fibroadenoma Mammariae (FAM) [13]. Patients with immunodeficiency conditions or serious medical condition who is receiving treatment can be persuaded by their physician to receive the vaccination. This included education and an explanation about how COVID-19 will affect their medical condition. Physicians are once again an important factor in reducing vaccination hesitancy among people with certain medical conditions because they understand the concerns and are the closest medical facility for them

[14]. Most respondents who have been vaccinated have no previous history of COVID-19 infection, while the majority of respondents who have had a history of COVID-19 infection have not been vaccinated. This is in accordance with information developments at that time regarding vaccine regulations.

Based on the data we obtained regarding the 'Knowledge' of all respondents. Our data showed that 33.5% of respondents do not know that the COVID-19 vaccine can be given to people who have a history of COVID-19 infection. In addition, it is also possible that the administration of the COVID-19 vaccine to people who have a history of COVID-19 has been delayed until at least three months after being confirmed to have recovered from COVID-19 [15]. Most respondents answered questions of the 'Knowledge' section correctly, which reflected that their knowledge about COVID-19 was quite good. However, almost half of the respondents still do not know about post-immunization co-occurrence. In addition, respondents who have not received vaccines were more likely to answer "don't know" than respondents who have received vaccines based on knowledge regarding COVID-19 vaccines that can be given to people with a history of COVID-19 infection; the dose of vaccine administration; and achieving herd immunity by administering vaccines.

According to Islam *et al.*, knowledge was significantly related to education, family type, family monthly income, and previous experience of taking vaccines [6]. Comparing participants with primary or secondary school education to participants with higher levels of knowledge about COVID-19, university graduates had higher odds of accepting vaccination [4]. In a U.S. study, it was discovered that there was a difference between those with and without a high school degree in terms of acceptance prevalence for receiving the COVID-19 vaccination [16]. The results of this study show that knowledge has an influence on the acceptance of the COVID-19 vaccination, although it is not significant. This is because the respondents in this study are in the youth age range with a history of education limited to senior high school and undergraduate, so they cannot optimally describe the relationship between education level and a wider range of acceptance of the COVID-19 vaccine. Therefore, the government is expected to promote education related to the COVID-19 vaccine to increase public understanding so that they will be willing to receive the COVID-19 vaccine [17].

In this study, we found a significant difference between respondents' attitudes who had not received vaccinations and those who had received COVID-19 vaccination. Both groups showed positive attitudes; however, respondents who received vaccination had more positive attitudes. This finding was directly

proportional to the knowledge score in participants who have received vaccination. Perception towards vaccine safety might also contribute to this finding. Age, gender, education, attitudes and perceptions about vaccines were most frequently observed to be significantly associated with vaccine acceptance or refusal [18]. As stated before, most respondents who have been vaccinated were students and workers. The attitudes of significant others and the vaccine requirement in their workplace or institution might affect vaccine uptake in this group. Cordina *et al.* found that the opinions of others, such as family, friends and healthcare professionals, were positively associated with willingness to take the vaccine [19]. Married couples are more likely to be vaccinated than those who are not; these findings are due to people's desire to protect their loved ones. Couples also have more information about vaccines due to frequent conversations [20].

In terms of perception, our result showed a significant difference in perceptions related to dangerous side effects and willingness to pay for COVID-19 vaccination. A higher percentage of people who believed that COVID-19 vaccination did not have harmful side effects were found in the vaccinated group. Pogue *et al.* also found that most participants who had not received vaccination in the USA stated that they were worried about the side effects of the COVID-19 vaccines [21]. As stated by Rief, most people experienced no or only mild adverse effects. Not all symptoms that occur following vaccination are caused by the vaccine [22].

A major trial investigating the Pfizer-BioNTech vaccine, with more than 40,000 people, reported 23%-33% fatigue rates after the first shot in the placebo group, 18%-34% of headache, and 8%-11% of muscle pain [23]. Most respondents who had received COVID-19 vaccination were willing to pay for COVID-19 vaccine, whereas in the other group was predominantly not willing to pay. Catma and Varol found that approximately 42 percent of the respondents would not pay for COVID-19 vaccine if the cost of the vaccine was fully paid by the respondents [24]. A study of willingness to accept a COVID-19 vaccine was nearly 70 percent in the U.S., but only 35 percent of the participants would be willing to pay US\$ 50 or more for it [25]. The economic factors such as expectations of free vaccination from the government, concerns over the vaccine's affordability, and seeking health insurance coverage were found to be considerable obstacles in self-paying vaccines acceptance [24].

There are some limitations in the interpretation of the findings from this study. Firstly, the period of study was too short, so the sample was not bigger enough to get more representative data. Secondly, a cross-sectional study was conducted, so the causality cannot

be analyzed to the findings in the regression models. Thirdly, the data collection used an online method that might have more biases. Hopefully, this study will contribute to health policy makers and planners to aim for the highest proportion of vaccination in Indonesia.

CONCLUSION

The COVID-19 pandemic scares everyone, but the COVID-19 vaccine has the most promising hope to combat the pandemic. The more people know everything about the COVID-19 vaccine, the greater the hope that the COVID-19 pandemic will end soon or at least be gentle. Massive health promotion strategies regarding COVID-19 vaccine safety, reassuring population, especially the unemployed population and COVID-19 survivors, should be taken by policymakers to ensure adequate knowledge, positive attitudes, and perceptions against COVID-19 vaccination. These steps are expected to reduce vaccine hesitancy that is mostly driven by false information in social media.

ACKNOWLEDGMENT

We thank all respondents for their kind cooperation to participated in this study. Thank to Coordination Bureau of Community Medicine, Department of Public Health and Preventive Medicine, Faculty of Medicine, Universitas Airlangga, who have supported this research to identify the factors that influence vaccine acceptance in Indonesian youth population.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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