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Determinants of the Willingness to Receive and Pay for COVID-19 Vaccines Prior to the Commencement of Vaccination in Indonesia

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Abstract

Background: The occurrence of various deceptive news on COVID-19 vaccines adversely impact the public mindset. Prior to the mass vaccination of the Indonesian government, perception of the willingness to be vaccinated and its determinant were not widely explored.

Objectives: Evaluating the determinants of willingness to receive and pay for COVID-19 vaccines prior to the commencement of widespread vaccination in Indonesia.

Method: A cross-sectional design analysis using bivariate and multivariate methods and qualitative research approach

Results: The determinants of willingness to be vaccinated were obtained, including the occupation of health workers and civil servants, perception of COVID-19 as dangerous, perception of the vaccines as effective, and perception of vaccine as safe. In terms of the determinants of willingness to pay, the following results were recorded, including respondents' age of 40 years, the income of IDR.2,500,000, experience from the interaction with COVID-19 patients, perception of the virus as dangerous, perception of health protocol discipline, and perception on the vaccine as effective.

Conclusion: The determinants of willingness to receive the COVID-19 vaccine included the occupation of health workers and civil servants, perception of the disease as dangerous, and perception of the vaccine as effective and safe. Meanwhile, the factors of willingness to pay included the age range of 40 years, high income, interaction with COVID-19 patients, perception of health protocol discipline, and the vaccines' effectiveness.

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INTRODUCTION

The *severe acute respiratory syndrome coronavirus 2*, also known as SAR-Cov2, is the virus responsible for the COVID-19 outbreak. This pandemic is described as a global public health emergency, with a widespread impact on virtually every aspect of human life, including the economy. World governments, laboratories, and institutions worked intensely to produce an active vaccine.[1,2] As a result, certain conditions appeared mandatory, such as the need for widespread vaccination using an effective and safe COVID-19 vaccine.[3] Under the circumstance of combating this pandemic, it takes between 55-82% of the population to be effectively immune, either using vaccination or herd immunity.[4] The pace of vaccine development has surpassed all records, although specific public figures doubt the effectiveness and safety.[5] There is a trend in various parts of the world causing a gradual decline in public willingness for vaccination. Based on an American poll from April-December 2020, approximately half the population refused to receive the vaccination.[6,7] A cross-sectional study was conducted in France in March-July 2020, where approximately 76.9% of the volunteers indicated willingness for vaccination.[8] Conversely, the vaccine rejection rate in Italy increased from 20-50%, while the willingness to pay decreased from 86.2-69.7% during and after the lockdown.[9] Several repeated cross-sectional studies in Hong Kong also observed a similar declining pattern, from 44.2% in the first wave to 34.8% in the third.[10] This refusal significantly reduces widespread coverage and prevents the success of herd immunity.[9]

Indonesia was possibly among the countries with the lowest enforcement of health protocol before vaccination. On social media, the hashtags with the highest rating (#IndonesiaTerserah and #Whatever Indonesia) were pioneered by Dr. Tirta due to personal disappointment with the prevalent conditions.[11] Alongside the announcement of the COVID-19 vaccination, several hoax news gained wider circulation, particularly in the areas of safety, effectiveness, and halalness.[12] These misleading information significantly influenced the government's target of vaccinating more than 70% of the population.[13,14] The existence of a budget constraint, where part of the cost is borne by the community, posed another primary concern. Therefore, it is necessary to understand the determinants of willingness to receive and pay for the vaccine. Furthermore, an online survey in September 2020 by the Ministry of Health in collaboration with ITAGI, UNICEF, and WHO, showed that around 74% of Indonesians were aware of the government's plan to initiate a COVID-19 vaccination program, with receipts in the range of 60%, although 65% of the respondents were not willing to pay.[15] Studies on factors contributing to acceptance and willingness to pay are critically needed to formulate contextually-specific health education and policies in achieving herd immunity targets from vaccination coverage.[16]

Consequently, the Indonesia Ministry of Health issued Ministerial Decree No. 9860 by the end of December 2020, confirming the provision of seven vaccines for official use. These medications were produced by Biofarma, AstraZeneca, Sinopharm, Moderna, Pfizer and BioNTech, and Sinovac Ltd.[17] Also, between December 2020 and January 2021, the media

e-ISSN 2774-2318
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reported on the prices with the issuance of distribution permits by BPOM (National Agency of Drug and Food Control). For instance, Detik Health revealed that the vaccines' prices ranged from IDR 200,000-IDR 800,000 per dose on 26 January 2021, at 2:35 p.m. Another media (Kontan.co.id) reported that 75 million people paid for the COVID-19 vaccination. However, studies on the vaccines and the price discourse by the mass media, as well as the willingness to pay, appeared minimal. Therefore, the purpose of this study is to evaluate the factors associated with the willingness for COVID-19 vaccination and initial payment, as well as the media discourse on the indirect purchase of the vaccines by certain persons.

METHODS

This cross-sectional design analyzed the demographic factors, including internal family, perceptions about the COVID-19, as well as the willingness to receive and pay for the vaccine. The target population was adults aged 18 years and above with the ability to read and understand the Indonesian language. In addition, during this pandemic, the country suffered diverse implications due to the limitations on face-to-face meetings, leading to online data collection. This study was conducted in Indonesia between January-February 2021, and the sample size was calculated using 60% of the vaccination acceptance data, comprising surveys from the Indonesian Ministry of Health, in collaboration with WHO, UNICEF, and ITAGI. Furthermore, Openepi version 3.01 was employed with 80% power and a two-sided 95% confidence level to obtain a minimum sample size of 653.

Participants were invited based on the snowballing approach using social media, such as WhatsApp, Facebook, Twitter, and other online platforms. The questionnaires were distributed through Google forms containing questions on age, gender, address, residence category, education level, marital status, occupation, employment, income, religion, primary breadwinner [options: father, mother, other], the primary caregiver [option: father, mother, other], main family decision-maker [option: father, mother, other], history of COVID-19 infection [options: ever, never], experience from the interaction with COVID-19 patients [options: ever, never], perception of COVID-19 as dangerous [Likert scale 0-10], perception of the implementation of health protocols [Likert scale 0-10], perception of effectiveness [option: sure effective, doubtful, unsure] and safety [option: sure safe, doubtful, not sure], willingness to be vaccinated [options: willing, doubtful, not willing] as well as the willingness to pay for COVID-19 vaccines. Furthermore, in the question of willingness to pay, three choices were provided. The first comprised the attributes of the COVID-19 vaccine as 78% effective, very very safe, available at regular clinics, and price options of IDR 300,000 IDR. 500,000 and IDR 800,000. Meanwhile, the second option represented the COVID-19 vaccine with 94% effectiveness, very safe, available in big hospitals, price options of IDR 300,000, IDR 500,000, and IDR 800,000, and the third choice was referred to as not intended to pay. This study had been reviewed by the research ethics committee of the Faculty of Medicine, University of Muhammadiyah Surakarta, and was declared morally fit based on the ethical clearance letter numbered No. 3349/B.2/KEPK-FKUMS/II/2021.

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Bivariate and multivariate analyses were performed on the categorical scale data, using chi-square and logistic regression tests, respectively. The significance of the crude odds ratio was calculated bivariate and adjusted with multivariate analysis, at = 0.05 for each. Subsequently, the statistical assessments were conducted with the support of SPSS for Windows software.

Google form was then used to perform the qualitative assessment, where the respondents related the reasons for not being vaccinated or unwilling to pay for the process. The completed fields were examined by content analysis, reduced to categories, and subsequently concluded.

RESULTS

A total of 1,010 volunteers completed the google forms, and the majority were under 30 years of age [46 %], slightly female-dominated, and mostly living in Java and other cities. These participants also demonstrated over 12 years of education, non-health and non-government employees [state civil servants/ASN (*Aparat Sipil Negara*)], Muslims, had an income of IDR 2.5 million or less, the primary decision-makers in the family other than only a father, perceived COVID-19 as dangerous, and absolutely disciplined in the implementation of health protocols. Furthermore, a high number of the respondents were married, the main breadwinner in non-paternal families only, and the primary caregiver other than only a mother, as well as showed a willingness to receive the vaccine [51%] (Table 1). In terms of the willingness to pay for the vaccines, the respondents preferred relative effectiveness to safety (Figure 1). Currently, 30% of the participants do not intend to pay for the COVID-19 vaccines. In the price category for each vaccine attribute, confident respondents showed a willingness to pay for each attribute with three price categories, with the maximum frequency occurring in the minimum cost [IDR 300,000]. Figure 2 shows the relatively minimal priority in vaccine effectiveness in terms of the willingness to pay compared to the safety. Even at the same price option [IDR 500,000], respondents prefer the effectiveness aspect.

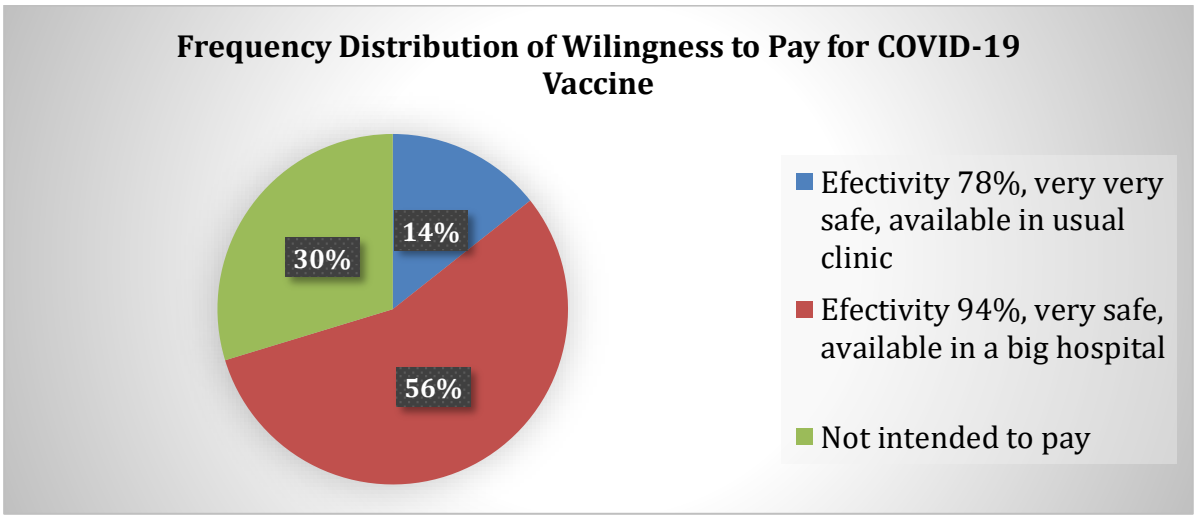

Figure 1. Frequency Distribution of Willingness to Pay per COVID-19 Vaccine based on Attribute

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Table 1. Characteristics of Respondents (n=1,010)

Variables	Attributes	Σ	%
Age	< 20 years	55	5
	20 - 29 years	415	41
	30 - 39 years	141	14
	40 - 49 years	208	21
	50 - 59 years	168	17
	> 60 years	23	2
Gender	Male	396	39
	Female	614	61
Residential Island	Outside Java	257	25
	Java	753	75
Residence category	Rural	386	38
	Urban	624	62
Educational Level	≤ 12 years	284	28
	> 12 years	726	72
Marital Status	Married	585	58
	Not Married	425	42
Occupation	Non-health workers	865	86
	Health Workers	145	14
Employment Status	Non-Civil Servants	802	79
	Civil Servants	208	21
Income	≤ IDR 2.500.000	633	63
	> IDR 2.500.000	377	37
Religion	Islam	991	98.1
	Kristen	9	0.9
	Catholic	9	0.9
	Belief [Kepercayaan]	1	0.1
The main family breadwinner	Only Father	459	45
	Other than only father	551	55
The primary caregiver in the family	Only Mother	459	45
	Other than only Mother	551	55
The main decision-maker in the family	Only Father	333	33
	Other than only father	677	67
History of being infected with COVID-19	Never	927	92
	Ever	83	8
Experience interacting with COVID-19 patients	Never	501	50
	Ever	509	50
Perception of the COVID-19 dangers	Less/not dangerous	178	18
	Dangerous	832	82
Perception of the implementation of health protocol	Lack of / no discipline	105	10
	Discipline	905	90
Perception on the COVID-19 vaccine effectiveness	Doubtful/not sure	586	58

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perceptions on the COVID-19 vaccine safety	Sure effective	424	42
	Doubtful/not sure	594	59
	Sure safe	416	41
Willingness to be vaccinated	Willing	520	51
	Not willing/doubtful	130/360 [tot=490]	49

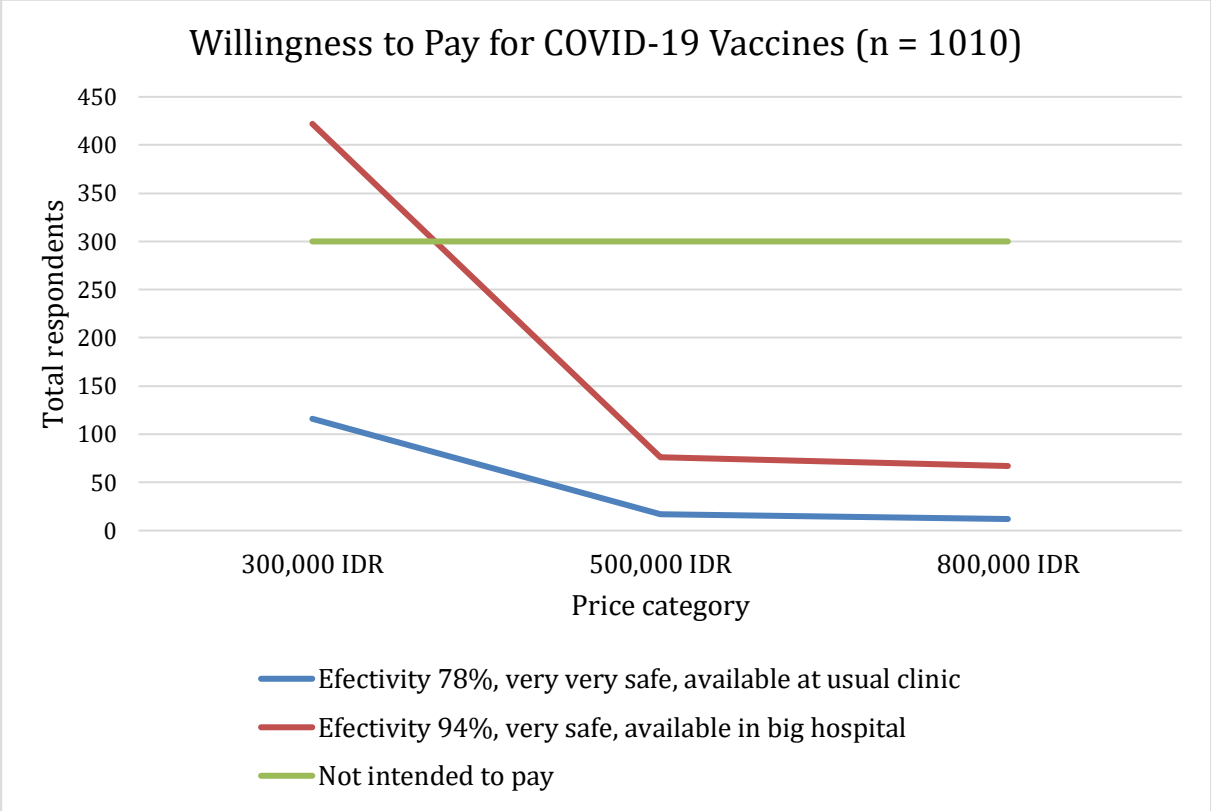

Figure 2. Frequency Distribution of Willingness to Pay for COVID-19 vaccine based on Attributes and Price Categories.

Among respondents who had doubts about their willingness to be vaccinated, 390 respondents [Table 1], when faced with a choice of vaccine type, emphasized the relative importance of vaccine safety over effectiveness [78% effectiveness, very, very safe, available in ordinary clinics] or vaccines that relatively emphasize effectiveness over safety [effectiveness 94%, very safe, available in the hospital], 65% of them [234 respondents] chose both options, the rest are still undecided [figure 3]. When given the choice of vaccine brand, the proportion that still remains uncertain is 54% [196 respondents] [figure 4]. This phenomenon may be explained that respondents who are hesitant are actually still waiting and observing what is happening around them regarding the good and bad effects of the existing vaccine choices. Specifically, in Figure 4 [choice of vaccine brand], the proportion of respondents who are doubtful is more than in the choice of vaccine performance [Figure 3]; it can be explained that respondents are still unfamiliar with the choices of existing vaccine brands.

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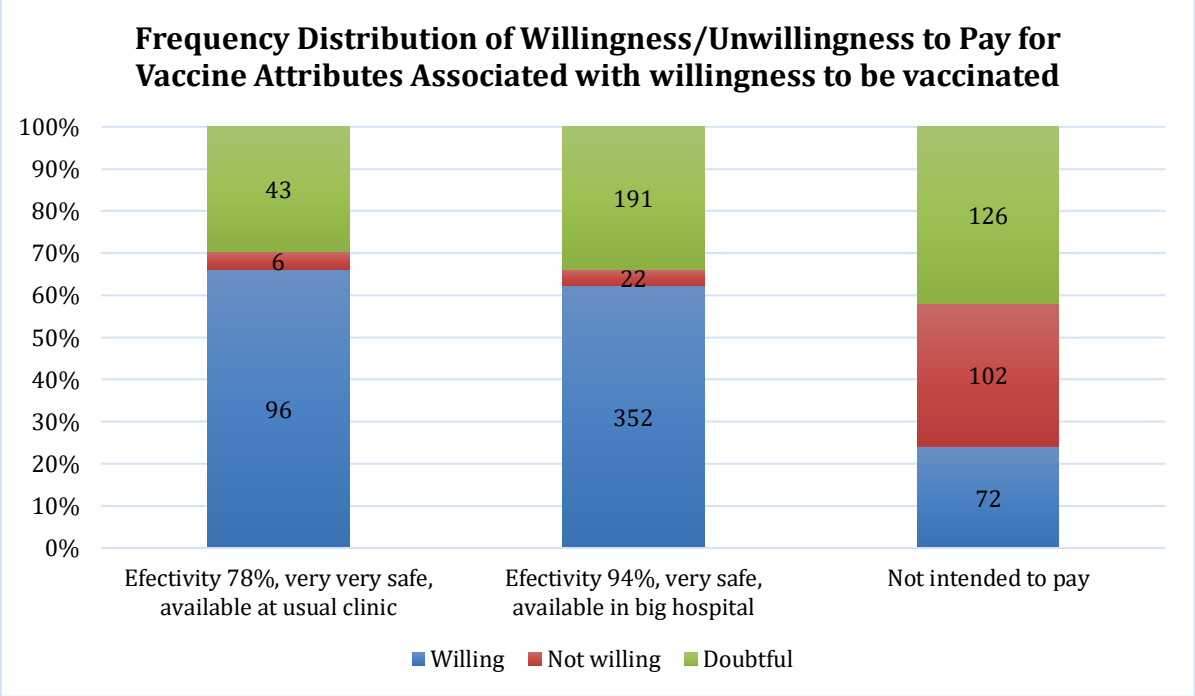

Figure 3. Frequency Distribution of Willingness/Unwillingness to Pay for the Vaccine Attributes Associated with the Willingness/Unwillingness to Receive the Vaccines.

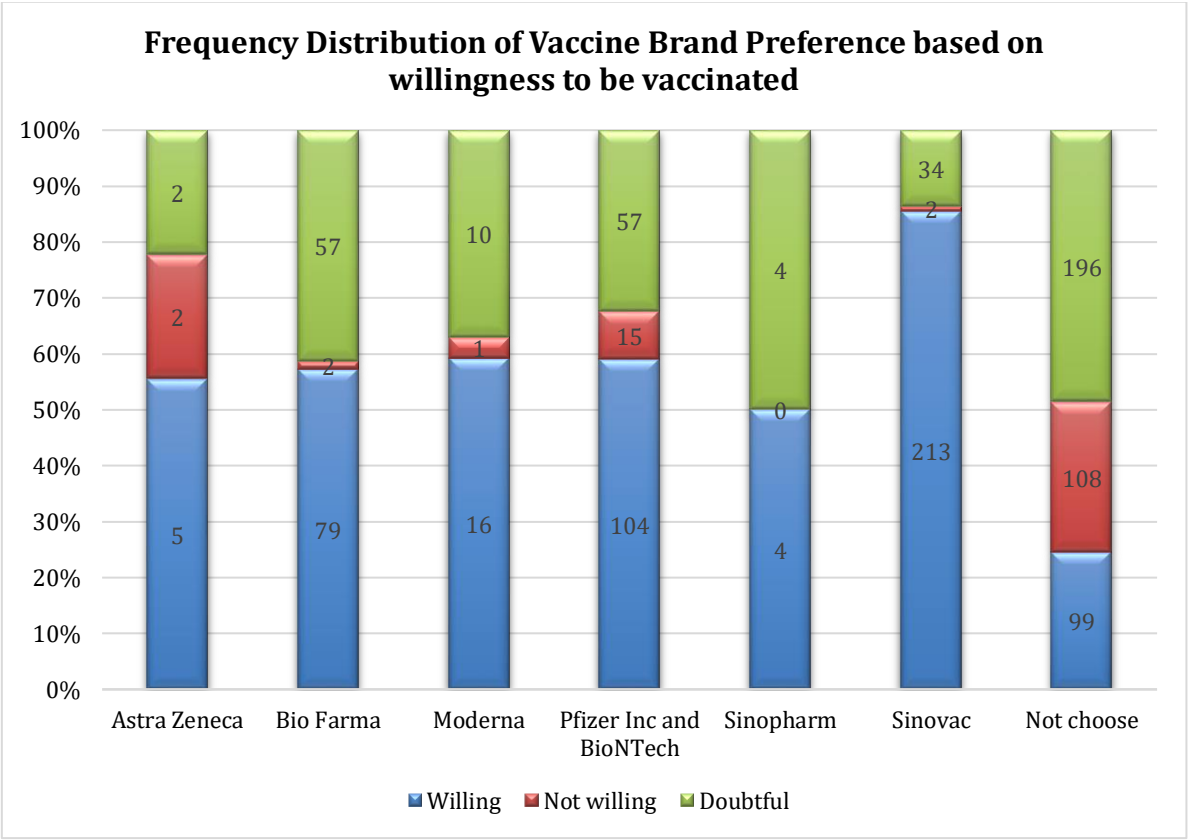

Figure 4. Frequency Distribution of Vaccine Brand Preference based on Vaccine Availability/Unavailability

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Table 2. Bivariate and Multivariate Analyses of the Determinants of Willingness to Receive the Vaccines

Variables	Attributes	Group		*Bivariate analysis*		*Multivariate analysis*	
		Doubtful/not willing (n=490) n (%)	Willing (n = 520) n (%)	OR	*P*	*a*OR	*P*
Age	≥ 40 years	217 (54)	182 (46)	1.476	0.003	1.085	0.778
	< 40 years	273 (45)	338 (55)				
Gender	Male	213 (54)	183 (46)	1.416	0.007	1.200	0.427
	Female	277 (45)	337 (55)				
Residential Island	Outside Java	133 (52)	124 (48)	1.190	0.230	1.029	0.907
	Java	357 (47)	396 (53)				
Residence category	Rural	183 (47)	203 (53)	0.931	0.580	0.985	0.945
	Urban/ Sub-urban	307 (49)	317 (51)				
Educational Level	≤ 12 years	133 (47)	151 (53)	0.910	0.503	0.827	0.482
	> 12 years	357 (49)	369 (51)				
Marital Status	Married	308 (53)	277 (47)	1.485	0.002	1.324	0.349
	Not Married	182 (43)	243 (57%				
Occupation	Non-health workers	460 (53)	405 (47)	4.354	0.000	3.638	0.000
	Health Workers	30 (21)	115 (79)				
Employment Status	Non-Civil Servants	406 (51)	396 (49)	1.513	0.009	1.776	0.030
	Civil Servants	84 (40)	124 (60)				
Income	≤ IDR 2.500.000	302 (48)	331 (52)	0.917	0.507	1.008	0.973
	> IDR 2.500.000	188 (50)	189 (50)				
Religion	Non-Islam	6 (32)	13 (68)	0.483	0.144	3.253	0.187
	Islam	484 (49)	507 (51)				
The main family breadwinner	Only Father	224 (49)	235 (51)	1.021	0.868	0.728	0.171
	Other than only father	266 (48)	285 (52)				
The main caregiver in the family	Only Mother	228 (50)	231 (50)	1.089	0.501	0.854	0.461
	Other than only Mother	262 (48)	289 (52)				
The main decision-maker in the family	Only Father	166 (50)	167 (50)	1.083	0.552	1.184	0.479
	Other than only father	324 (48)	353 (52)				
	Never	455 (49)	472 (51)	1.322	0.228	0.950	0.903

e-ISSN 2774-2318
p-ISSN 2407-0505

History of being infected with COVID-19	Ever	35 (42)	48 (58)				
Experience interacting with COVID-19 patients	Never	248 (50)	253 (50)	1.082	0.534	1.019	0.929
	Ever	242 (48)	267 (52)				
Perception of the COVID-19 dangers	Less/not dangerous	138 (78)	40 (22)	4.705	0.000	2.161	0.010
	Dangerous	352 (42)	480 (58)				
Perception on the implementation of health protocol	Lack of / no discipline	75 (71)	30 (29)	2.952	0.000	0.963	0.914
	Discipline	415 (46)	490 (54)				
Perception on the COVID-19 vaccine effectiveness	Doubtful/not sure	464 (79)	122 (21)	58.219	0.000	13.156	0.000
	Sure effective	26 (6)	398 (94)				
perceptions on the COVID-19 vaccine safety	Doubtful/not sure	469 (79)	125 (21)	70.573	0.000	15.769	0.000
	Sure safe	21 (5)	395 (95)				

OR=Odd Ratio; aOR=adjusted Odd Ratio

At the beginning of the mass vaccination program, Sinovac was the most prevalent vaccine brand among the existing vaccine brands, followed by Pfizer Inc., Biontech, Biofarma, Moderna, Astra Zeneca, and Sinopharm (figure 5). However, most of the respondents still do not choose any brand.

Based on the bivariate analysis, the determinant factors for the willingness to receive the vaccine included age range below 40 years, female gender, unmarried status, health worker occupation, government employee [civil servants/ASN (*Aparat Sipil Negara*)], perception of COVID-19 as dangerous, self-disciplined perception of applying health protocols, as well as assumed vaccine safety and effectiveness. Table 2 represents the multivariate analysis results where the apparent factors of the willingness to be vaccinated were health worker occupation, government employees, perceiving COVID-19 as dangerous, and the vaccine as effective and safe.

Based on the multivariate analysis, no significant determinant was observed in the willingness to pay for vaccine attribute A. The significant factors as determinants of willingness to pay for vaccine attribute B as well as the deterrents included the age range below 40, income above IDR 2, 500,000, interaction with COVID-19 patients, perception of COVID-19 as dangerous and disciplined in implementing health protocols, as well as the vaccine effectiveness. However, the perception of the vaccine as relatively safe was not among the determining factors.

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p-ISSN 2407-0505

Table 3. Multivariate Analysis of Willingness to Pay for the Vaccines

Variables	Preference for willingness to pay for the type of COVID-19 vaccine					
	Vaccine A has an effectiveness of 78%, very very safe, and is available in usual clinics; price options are IDR 300,000; IDR 500,000; IDR 800,000		Vaccine B has an effectiveness of 94%, is very safe, available in big hospitals, and has price options of IDR 300,000; IDR 500,000; IDR 800,000		Not intend to pay	
	aOR	*P*	aOR	*P*	*a*OR	*P*
Age (ref ≥ 40 years)	0.783	0.366	2.048	0.000	0.483	0.000
Gender (ref male)	0.779	0.209	1.244	0.141	0.911	0.579
Residential Island (ref Outside Java)	1.104	0.660	0.889	0.474	1.099	0.616
Residence Category (ref Rural Area)	0.715	0.078	1.360	0.032	0.852	0.322
Educational Level (ref ≤ 12 years)	0.987	0.954	0.822	0.284	1.326	0.181
Marital Status (ref Married)	1.839	0.027	0.918	0.666	0.727	0.157
Occupation (ref Non-health workers)	0.791	0.388	1.492	0.060	0.620	0.082
Employment Status (non-Civil Servants)	0.929	0.766	1.063	0.731	1.030	0.880
Income (ref ≤ IDR 2,500,000)	0.809	0.335	1.631	0.002	0.629	0.008
Religion (ref non Islam)	1.034	0.959	1.539	0.393	0.487	0.208
The main breadwinner in the family (ref only father)	0.925	0.699	1.009	0.953	1.033	0.849
The main caregiver in the family (ref only mother)	1.147	0.478	1.090	0.543	0.796	0.153
The main decision-maker in the family (ref only father)	0.872	0.511	1.345	0.056	0.756	0.106
History of being infected with COVID-19 (ref Never)	1.201	0.576	0.637	0.075	1.686	0.062
Experience interacting with COVID-19 patients (ref Never)	0.858	0.424	1.422	0.013	0.700	0.026
Perception on the COVID-19 dangers (ref Less/not dangerous)	0.928	0.790	2.211	0.000	0.465	0.000
Perception on the implementation of health protocol (ref Lack of/no discipline)	0.937	0.847	1.834	0.014	0.552	0.015
Perception on the COVID-19 vaccine effectiveness (ref doubtful/not sure)	1.665	0.090	1.760	0.011	0.316	0.000
Perceptions on the COVID-19 vaccine safety (ref doubtful/not sure)	1.650	0.096	0.936	0.767	0.740	0.260

OR=Odd Ratio; aOR=adjusted Odd Ratio

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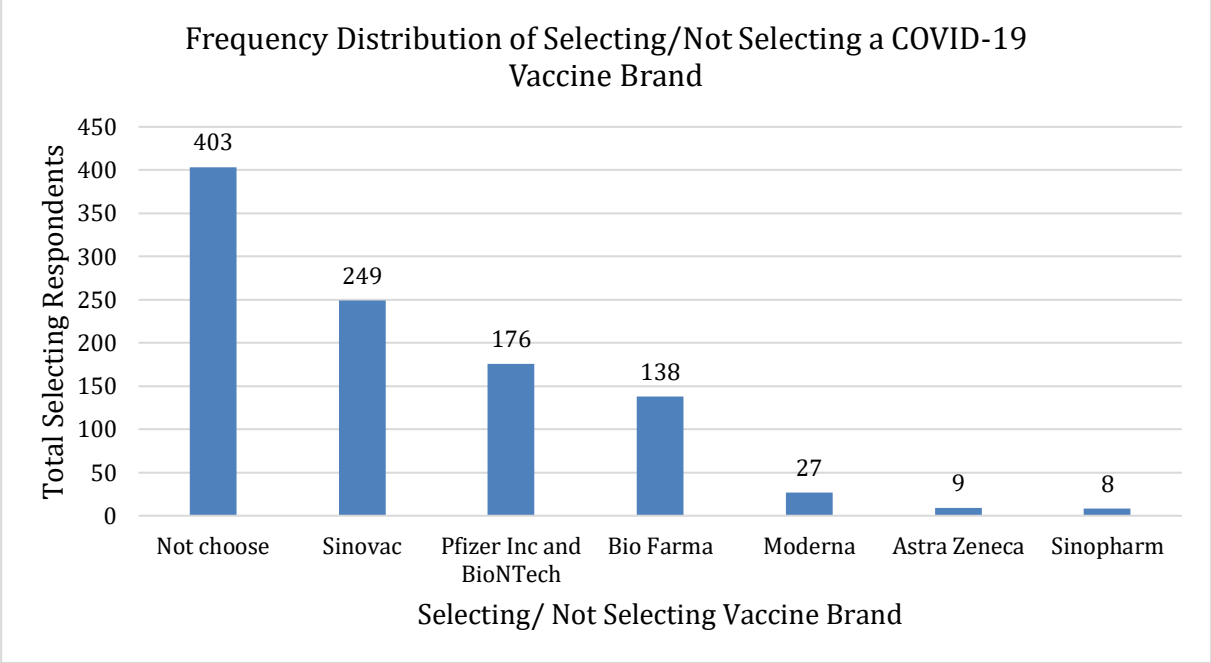

Figure 5. Frequency Distribution of Selecting/Not Selecting a COVID-19 Vaccine Brand

The content analysis of the questionnaire data showed that the majority of the respondents did not reflect the willingness to pay for the vaccine. However, certain persons expressed the reasons for their willingness/unwillingness to be vaccinated. Based on the data reduction, categorization, and conclusion from the content analysis, six issues related to the willingness/unwillingness to pay for the COVID-19 vaccine were observed, including the perceptions of information on the vaccine effectiveness and safety, the view of health equity concerning vaccine accessibility and affordability, suspicion of the COVID-19 pandemic and its vaccine, choice of actions in overcoming the COVID-19 pandemic, personal circumstances surrounding the vaccine availability as well as the nationalism on vaccine procurement.

The first issue was the perception of information on the effectiveness and safety of the COVID-19 vaccine. Under this circumstance, the above expression was categorized into two, termed unsure and sure. Unsure conditions were presented as *"doubtful," "still doubtful," "Not sure yet," or "Because I still have doubts about the safety and efficacy."* Particular cases were dependent on official information from authorities such as BPOM [*Badan Pengawas Obat dan Makanan* / similar with Food and Drug Administration (FDA) in USA] and doctors, as stated in the following expressions, *"Because it has not been approved by BPOM," "because it has not been legalized by BPOM,"* and *"I am not willing if there is no recommendation from the doctor."* Also, certain statements emphasized the fear of a "bad" impact on the occurrence of side effects, such as, *"We have a fear of side effects that worsen the physical and psychological conditions."* Appropriate information is essential and expected to increase trust, as stated, *"Because there is no/not yet explained the application criteria for the condition of the person to be vaccinated. The disease background should be known to determine the specific appropriate vaccine. If there are symptoms of diabetes, high blood pressure, heart, and cholesterol, can the person be vaccinated carelessly? Moreover, take care of nutrition and stamina*

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looks better, and pray". Further expressions also indicated the need for more precise insights, *"Because we have not studied in detail the types of vaccines above*" and "*Because we are not well educated about the vaccine."* A distinctive feature of the Muslim community is the issue of halalness as a barrier to obtaining trust and willingness to be vaccinated. The phrase, *"We are not yet sure about the halalness and the effect on the relationship between immunity and health,"* instigates doubt from a religious perspective. This disbelief is only peculiar to the COVID-19 vaccine. Based on the statements, the *vaccine is an attenuated virus; hence I am afraid… In terms of the vaccine for babies, I got it complete, and so do my children"*. In reference to media publications on vaccine effectiveness, individuals in the specific category expressed that, *"The vaccine is proven 94% safe*". There are also persons who were sure and willing to pay for vaccine A at a price of IDR 300,000, but expressed technical concerns such as, "*I want to buy but afraid of injection*." Several individuals emphasized the importance of administering vaccinations in extensive hospital facilities, as the expression "*I trust in complete health facilities such as large hospitals*." Among the unsure attitudes with the potential to change is the "*wait and see*" mentality or depending on the attitude of the surrounding persons. Furthermore, the phrases "*I am still not 100% sure because friends are still doubtful*", *"I will not buy if it has not been proven that the vaccine can prevent or make the body immune to COVID-19,"* and *"As long as there is no transparent data from the government or the health institutions related to the vaccine, then I will not accept,"* reflects these issues.

The second issue was the perspective of health equity on the accessibility and affordability of the vaccine. Phrases such as *"free," "Hope it will be facilitated," "Waiting for a free vaccine from the government," "Vaccine for a pandemic should be free with proven high efficacy and rare side effects,"* and *"the procurement should be the responsibility of the government and the community just use it"* and *"I hope there is a vaccine that is very effective, has no side effects, provided by the government for free"* instigate a deep desire that the medication is a public commodity [not a commercial product], with equal public access. This expression was not only directed to individuals who do not show interest in paying but also encompassed the willing to pay category. A respondent with a preference for vaccine A at IDR 300,000 wrote, *"Because this is an epidemic, the state should provide a sense of security and comfort for the community."* Considering vaccines as a public good, a sarcastic tone was observed, including, *"There is no further study on this vaccine. Vaccine efficacy based on price? Is this a way to free the community from corona disease or a field to make money?"*. Particular volunteers recommended free vaccination for certain vulnerable groups, with the expression, *"If necessary, the government will make it free for the certain communities."* Chinese government policies further increased the willingness to receive the vaccines from 73.62-82.25%, and the concern about safety, side effects, as well as the effectiveness remained the main priority of the respondents, including the reason for the unavailability of being vaccinated in the unwilling group.[18]

The third issue involved suspicion about the COVID-19 pandemic and its vaccines. This attitude showed that the respondents had specific hidden intentions. Various distrust expressions included, "*COVID-19 is a conspiracy disease, lies*", *"Do not believe in the Vaccine," "There is something odd about COVID-19,"* and considered vaccination a useless effort, based on the phrase, *"What is it for? in my opinion, it is wasteful"*.

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Distrust is also associated with previous news involving the criminal case of vaccine counterfeiting and is reflected with the phrase, *"I fear that the vaccine is no longer authentic; it could have been mixed with other ingredients."* This statement is related to an instance where the respondent was not willing to pay [hypothetically], as well as an initial business suspicion behind vaccine campaigns. However, the reason described a particular family's dissatisfaction when the father had lung disease with suspected COVID-19 and the hospital's lack of transparency considering the diagnosis. The complete statement is as follows, *"The halal certification of the vaccine is not yet clear, and this covid is often used as a business field for certain individuals. For example, since the PSBB [Pembatasan Sosial Berskala Besar / lockdown] relaxation, several people move freely without considering any clear rules. Prior to the vaccination commencement, it was heralded again as if this disease was becoming more extensive and deadly. This atmosphere created fear in the community, leading to a significant willingness for the vaccine. Meanwhile, the central government had never taken a firm stance on the widely spread misleading information. Just a note: my father died and was claimed by the hospital to be infected with COVID-19, but the results of the PCR swab were never shown. Even the doctor ordered my father to be moved from the isolation room because he had a lung infection and not COVID-19. Moreover, screening and PCR swab by the health authorities was also performed on our family. After more than two weeks, the results showed that we were positively infected, while the lab test results were never revealed. Also, our family secretly conducted an independent swab, and the results were all negative. During the period of my father's admission until his death, we were left to care for him, and even after he died, the health authorities did not come or recommend self-quarantine or anything. There are currently several incidents that do not follow the facts; for example, negative patients were reported as positive. Moreover, It is clear that we, as a local community, feel these occurrences are merely part of politics."* The last statement was also in line with the popular term in the community, including being *"covided"* by hospitals, typically coupled with suspicions or rumors of clinical commercialization. Based on these specifications, extensive reports on positive cases indicated additional money for the hospital [author YAR's experience from dialogue with community members].

There was also distrust based on information bias such as *"Worried that the vaccine kills," "Not safe. Especially made by Sinovac. Even, they do not use it themselves"*, *"The effectiveness of vaccines is measured by the efficacy value, according to a reliable data in Brazil, the value is specified at 50%, which is doubtful. Therefore buying the vaccine at the lowest price of IDR 300,0000 with arguably dubious efficacy is not worthwhile"*, and *"The vaccine has not been tested in their own country (China) instead was brought to Germany."* There is a strong impression that China vaccines are compared to other products, generally perceived as second-class goods, such as the expression, *"Because I do not want to be vaccinated with Chinese vaccines..."*. Politicians that speak publicly about their doubts about vaccines also add to this distrust, as expressed, *"Because even one Indonesian politician has doubts about the COVID-19 vaccine"*. Also, persons who do not believe in the COVID-19 vaccine, hardly believe in all types of vaccines or openly say that they are anti-vaccine adherents, based on the following statement, *"I do not believe in vaccines, and indeed my family has never been vaccinated, especially since this pandemic, it is increasingly unsure of vaccines"* and *"Anti-vaccine adherents."*

The fourth issue was the provision of other alternatives in overcoming the pandemic besides

e-ISSN 2774-2318
p-ISSN 2407-0505

vaccines. A phrase such as *"not yet interested in vaccines"* implies the existence of other alternatives. Several respondents believe that COVID-19 is not harmful, and only certain people are at high risk, as represented by the following statement: *"No one dies from pure 100% COVID-19, there should be accompanied complications from previous diseases worsening the situation and the immune system."* Therefore, the respondents decided not to pay and were not willing to be vaccinated, although a certain proportion of this category prefer other preventive measures such as complying with health protocols and keeping their bodies in good condition. The following phrases are examples, *"It is enough to take preventive measures by following health protocols such as wearing masks, keeping a distance and consistently washing hands and personal hygiene, as well as consuming sufficient nutrients. It should stay happy to strengthen the immune system."* Furthermore, physical and spiritual efforts should also be fulfilled, as the following expression, *"apart from maintaining maximum health, there is also need to conduct worship as best as you can according to your ability and belief, pray earnestly. We should be assured of Allah's safety,"* and *"we set the pattern of life like the Messenger of Allah."* Particular respondents emphasized on ablution as a reliable action, *"I keep my ablution outside and inside the house"*. Another volunteer focused on the nutritional aspect, as expressed in, *"I do not want to be vaccinated, but I want to strengthen antibodies by nutritious eating and drinking"*. Meanwhile, other respondents stressed appropriate compliance with health protocols as a way of overcoming the COVID-19 pandemic, *"Obeying health protocols is the most informant"* and *"It is enough to perform self-isolation for 2 Weeks"*. A more comprehensive measure was recommended instead of the health protocol, *"A balanced nutritional diet, adequate rest, and exercise are enough"*. There are fatalistic expressions such as, *"Allow natural vaccination"*, or simply write *"Tawakal"*, *"Tawakal to Allah"*, *"God willing, you will be healthy"* and there is need to write down reasons that cannot be traced logically, such as the phrase, *"Thank God I have been living a healthy life since I was young without any vaccines or immunizations....the best vaccines are from nature, InsyaAllah...humans are from the soil, hence it is nature who takes care is the nature itself"*. These fatalistic attitudes were demonstrated by observing the proportion of vaccinated persons who are still prone to possible infection, as the following expression says, *"because you can still get the virus, it's better to be natural by maintaining your own immunity with health protocols and living regularly"*. In another perspective, herbal solutions have also emerged as part of non-vaccine alternatives, as stated, *"By implementing health protocols, taking care of yourself with good nutrition and herbal supplements, Insha-Allah it will be enough"* and *"Improve the immune system with faith in worship of good nutrition, herbs. .. also healthy for our psyche"*. Certain persons referred to herbal medicine, as expressed in, *"I just do independent therapy by always keeping my body condition always fit, drinking herbal medicine, exercising regularly and taking care of the psyche to always be healthy"*.

The fifth issue was personal conditions that inhibited the ability to purchase the COVID-19 vaccine. Present financial situations impede the buying of vaccines, as the statement, *"the income from freelance drivers is currently only enough to buy family meals; hence I can eat and be healthy. Instead of buying vaccines, it is better to buy rice"*. Realistic individuals with financial conditions prefer alternative means other than vaccines; if not all of the vaccines are obtained for free, as the ex-

e-ISSN 2774-2318
p-ISSN 2407-0505

pression, *"the price of the vaccine above is not affordable..., then the option we take is to strive, namely by always trying to carry out 3M [public movement initiated from Indonesian Government 3M= Mencuci tangan (washing hand); Memakai masker (wear a mask); Menjaga jarak (keep the physical distance) for Covid-19 spreading protection) and tawwakal to Allah Subhanahu wa Ta'ala, then if our destiny to get infected, it has become Allah's decree & in sha Allah, Allah always gives the best for us"*. Particular respondents mentioned personal medical conditions hinder the vaccination. The following phrases highlighted personal medical and economic reasons, *"High blood pressure. No money"*. There are also COVID-19 survivors who do not see the need to buy vaccines based on the reason of *"I have been confirmed positive for COVID-19"*.

The sixth issue was nationalism also emerged as a reason not to pay for the vaccine, such as the use of the phrase, *"Because it should be free and made by the nation itself."*

DISCUSSION

Vaccine rejection refers to the delay in receiving or refusing vaccination, irrespective of accessibility [19]. In general, the hypothetical acceptance of vaccination in this study was 51%, while the respondents' willingness to pay for the product's safety and effectiveness attributes was 70.3%. Implicitly, a significant increase occurred in the clarity of safety and effectiveness than the willingness to be vaccinated. In comparison to the survey results by the Indonesian Ministry of Health, ITAGI, WHO, and UNICEF in September 2020, a downward trend was observed. A previous study in Kuwait around August 2020 showed the involvement of 2,368 respondents. Based on the online questionnaire data, 53.1% of these participants stated a hypothetical willingness to be vaccinated.[20] Similarly, another investigation revealed that 6,922 students received free and self-paying vaccinations, at the rate of 78.9 and 60.2%, respectively, in November 2020 within five provinces outside Wuhan, China.[21]

Generally, the perceptions of vaccine effectiveness in reducing COVID-19 infection as well as its safety from harmful side effects were possible factors associated with the willingness to be vaccinated. Similar observations were reported in an earlier study in Russia involving 876 respondents.[22] In addition, the gender effect as a related determinant tends to vary, although men were more likely to receive the vaccine.

Furthermore, three studies in Finland discovered that a higher perception of COVID-19 as a life-threatening disease leads to increasing demand for vaccines.[23] In France, a study with a cross-sectional design was conducted between March-July 2020, involving 2047 respondents, with 76.9% willing to be vaccinated. Therefore, older persons, female gender, fear of COVID-19, and individuals possibly at risk of contracting COVID-19 are the determining factors for the hypothetical willingness to receive the vaccination.[8]

Based on a study in Chile, the willingness to pay for a COVID-19 vaccine was assessed in 531 volunteers from July-August 2020. The results indicated that income, educational level, and the existence of a family member with COVID-19 were factors associated with a willingness to pay for a vaccine hypothetically at $232.[24]

e-ISSN 2774-2318
p-ISSN 2407-0505

In Hong Kong, government recommendations greatly influenced the willingness to be vaccinated, while COVID-19 susceptibility was not associated with acceptance.[16] However, the male gender, belief in vaccine conspiracies, COVID-19 susceptibility, and presence of minimal risk factors contributed significantly to vaccine rejections in America.[25] These circumstances appear to be a common indication that public health distrust poses a barrier to vaccination, both in terms of community development and implementation.[26] Furthermore, two large-scale obstacles to vaccination, termed structural and behavioral, were observed in America. Structural barriers include systemic components preventing access to adequate health services, such as time, cost, transportation, and location constraints. Meanwhile, behavior in this context refers to the perception or belief influencing the willingness of individuals at-risk to seek or receive health services. Possibly, both barrier types were also related to the COVID-19 vaccination service.[27] In another instance, a cross-sectional design in the UK with 32,361 volunteers associated negative behaviors with vaccine rejection, in terms of the general distrust of vaccine benefits, assumed adverse after effects, concerns about the commercialization of the vaccines for profit generation, as well as high preference for naturally-based immunity.[28] Taiwan, as a country relatively safe in the context of COVID-19 infection, showed minimal willingness to be vaccinated both among healthcare workers [23.4%] and outpatients [30.7%].[29] Furthermore, the role of social ecology is also significant in increasing vaccination awareness. Based on a previous study with 592 respondents in America around July 2020, the factors associated with unwillingness to be vaccinated were significantly minimal trust level in the CDC as a source of COVID-19 information, low social norms of preventive behavior, high skepticism about COVID-19, more political inclinations, less related to women and more visible in marginalized groups, such as the blacks.[30]

The unsure attitudes with the potential for modification include *"wait and see"* or, depending on other people, phrases such as *"Still not 100% sure because friends are still in doubt"*, *"Do not buy if it has not been proven that the vaccine can prevent or make the body or immune resistant to COVID-19"* appear relatively common. The wait-and-see phenomenon was also observed in respondents from Spain, with 55.4% preference.[31] This is a *"common"* occurrence, based on the results of a systematic review of 126 publications that emphasized the importance of transparency in restoring public trust in health institutions.[32] An article on JAMA responded to the emergence of opinions on paying people to be vaccinated in an effort to achieve herd immunity objectives. This concept appeared problematic because the realization was not a suitable investment, and secondly, the willingness to be vaccinated is a citizen's responsibility as a "living fence" for their vulnerable fellows. Actually, the unwillingness to be vaccinated was mainly attributed to the nature of public uncertainties.[33] In general, the wait-and-see phenomenon also originated from the lack of confidence in the effectiveness and safety of the COVID-19 vaccines, probably because the inoculations are entirely new and need further evidence.[28] This group exhibits great potential in becoming vaccinated if the information transparency demands in terms of effectiveness, safety, and availability are fulfilled.[34]

e-ISSN 2774-2318
p-ISSN 2407-0505

Health workers were generally willing to be vaccinated, based on a multinational study in December 2020 involving 1,720 health workers in 6 countries, with 95% willing to be vaccinated. These individuals were more likely to perceive the severity of the COVID-19 pandemic, consider the vaccines to be safe, demonstrate less financial problems and minimal stigma about vaccines, as well as exhibit a higher prosocial mindset and trust in health authorities [35]. Similarly, a previous study in Kuwait also reported that doctors were the most willing group to accept the vaccination.[20]

In this study, the opinion *"COVID-19 is a conspiracy disease, lies"* is categorized as a form of skepticism. This concept is defined as the denial of a severe disease state and the perception that this pandemic is an exaggeration as well as a hoax.[36]

"Worried that the vaccine will kill," "It is not safe. Moreover, it has been made by Sinovac. They do not use it themselves.", "The vaccine has not been tested in their own country (China); instead, they buy it from Germany." Obviously, several misleading reports were widely circulated, probably as statements from inaccurate sources, disinformation [deliberately wrong for a specific purpose], misinformation [accidentally wrong, but spread], fake news, and yellow journalism. As a consequence, specific individuals were significantly influenced, specifical persons with minimal media literacy.[37] Furthermore, six types of false and harmful information were identified in Europe during the COVID-19 pandemic, such as preventing people from implementing protective measures, promoting erroneous but harmful drugs intended as antivirals, misrepresenting the mechanism of virus transmission, underestimating the risks associated with pandemics, deceiving people into buying fake/inappropriate protection as an antivirus as well as the victimization and spread of hate speech.[38] Additionally, the exposure to fake/inappropriate news is a global phenomenon, and a survey in Spain reported that 81% of the respondents perceive fake news as "often" or "several times," and only 7% almost never bothered.[31] An investigation of Jordan students also obtained similar results, including the observation that vaccine rejection was associated with the belief in a COVID-19 conspiracy and its vaccines.[39] Another analysis on related social media posts in India recorded 47% neutral and 17% negative emotions, while the remaining were positive.[40] These posts did not rule out the possibility of mutual influence considering the acceptance or rejection of the COVID-19 vaccine for various reasons. Another study on social media posts that involved labeling fake news hashtags by social media companies tends to alter the opinion of confident respondents in an attempt to limit the widespread misinformation.[41]

The view of health equity was related to the accessibility and affordability of the COVID-19 vaccine, with phrases such as *"free," "Hope it will be facilitated," "Waiting for a free vaccine from the government,"* and *"Vaccine for a pandemic should be free with proven high efficacy and rare side effects," "the procurement should be the responsibility of the government. People just use it"* and *"I hope there is a very effective vaccine, no side effects, provided by the government for free."* Public absorption of the COVID-19 vaccine is a complex concept involving several organizational, structural, socio-cultural, and individual factors. Therefore, it is known as the 5A model, termed access, affordability, awareness, acceptance, and activation. Access refers

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to an individual's ability to obtain the recommended vaccine, and affordability is defined in terms of cost. Awareness shows the degree of knowledge of the associated benefits and risks, while acceptance is a measure of agreement, questioning, or rejection. Finally, activation describes the extent individuals are prompted to participate in the vaccination process.[42] This study explored the willingness to pay for COVID-19 vaccines and evaluated its factors but did not comprehensively explore an acceptable price range as similar willingness to pay (WTP) study in America [43] or Chile.[24] More importantly, vaccination is a compassionate issue in Indonesia, and certain people currently perceive that vaccines are a public good.

The various unsure expressions include *"Covid is a conspiracy disease, lies," "Do not believe in the Vaccine," and "There is something odd about COVID-19"*. In various studies, the belief that the COVID-19 pandemic is a conspiracy drastically reduces the adherence to preventive measures or compliance with health protocols and is associated with the willingness to be vaccinated.[44] Previous studies on 683 participants in America observed a trend towards younger ages, better health, politically conservative leanings, more likely to endorse skeptical statements, less engagement with COVID-19 preventive measures, and more belief in conspiracy theories accusing China of the virus spread.[36] Similar observations were reported in an investigation involving 2726 respondents in Poland, where a conspiracy belief blaming the government for the pandemic was negatively correlated with protective behaviors.[45] In Serbia, conspiracy assumptions were connected with a specific type of character, including personality disintegration. However, when associated with recommended health behaviors, personality disintegration was mediated by high experiential and low rational thinking types.[46] These findings highlighted the importance of a more comprehensive approach involving psychologists in the communication strategies peculiar to increasing the vaccination acceptance.

CONCLUSION

Prior to the implementation of mass COVID-19 vaccination, half of the respondents stated their willingness to be vaccinated [51%]. The determinants of willingness to receive the vaccines were occupational factors of health workers and civil servants. However, the willingness to pay is greatly determined by younger ages, higher income, interaction with COVID-19 patients, perception of COVID-19 as dangerous, self-discipline in implementing health protocols, and assumed effectiveness of the COVID-19 vaccine. The content analysis results recorded six issues of significant importance, including information on the effectiveness and safety of the COVID-19 vaccine, health equity issues related to the accessibility and affordability of the COVID-19 vaccine, suspicion of the pandemic and its vaccine, choice of actions in overcoming the disease outbreak, personal circumstances considering the vaccine availability and nationalism related to the procurement of COVID-19 vaccines.

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