Acceptance of COVID-19 Vaccination during the COVID-19 Pandemic in Sei Penuh City

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Abstract

The incidence of COVID-19 has shown a downward trend in recent months, but transmission is still possible; it is because COVID-19 is still a pandemic, and there may be new variants that can cause an increase in cases. Countermeasures are carried out not only through prevention efforts by health protocols but also through vaccination efforts. Vaccines have proven to impact efforts to deal with the COVID-19 pandemic positively. Accepting the COVID-19 vaccine is one of the keys to fulfilling vaccination achievements. Sei Penuh City is one of the areas in Jambi Province where COVID-19 vaccination coverage is still low, at 53.6% as of August 28, 2022. Therefore, this study aimed to determine the determinants of COVID-19 vaccine acceptance in Sei Penuh City. A cross-sectional design study was applied and conducted in Sei Penuh City in July 2022. The population of this study were all people aged ≥18 years who live in Sei Penuh City, with a sample of 300 people. Sampling used a 2-stage cluster method using Probability Proportional to Size (PPS). Villages in this PPS are villages with COVID-19 vaccine coverage second dose less than 50%. Data were analyzed descriptively and analytically. The results showed that respondents who received a second dose or more of the vaccine were 54.7%. Multivariate analysis showed that health protocols (aPR=1.64; 95%CI: 0.99-2.70) and education level (aPR=1.38; 95%CI: 1.02-1.86) were associated with receiving a second dose of vaccines. This study found that health protocol was the most dominant risk factor for COVID-19 vaccine acceptance. Socialization and education still need to be carried out, especially about the urgency of the COVID-19 vaccine in facing the COVID-19 pandemic. In addition, people with low education levels need more attention in increasing the achievement of COVID-19 vaccination.

Keywords: COVID-19 vaccine, education level, health protocol, preventive behaviour

INTRODUCTION

The COVID-19 pandemic is still a public health problem, both in the world and in Indonesia, although the last few months have decreased cases. WHO reported the cumulative number of confirmed cases of COVID-19 as 763,740,140 cases with 6,908,554 deaths as of April 19, 2023 (WHO, 2023). In Indonesia, during April 2023, there was an increase in daily cases, which was thought to be due to a new variant of the SARS-COV-2 virus that causes COVID-19. According to the Ministry of Health report on April 18, 2023, daily cases reached 1,343 confirmed cases. There were 6,762,804 confirmed cases of COVID-19 in Indonesia, with 161,170 deaths up to April 21, 2023. In Jambi Province, as of April 21, 2023, the cumulative number of confirmed cases of COVID-19 was 39,442, with 915 death (Kemenkes RI, 2023a). Sei Penuh City is one of the areas in Jambi Province that is also affected by COVID-19 and is the area furthest from the centre of the Jambi Province government, besides Kerinci Regency.

Confirmed cases of COVID-19 in Sei Penuh City as of October 02, 2022, were reported at 1,544 cases, with 21 cases of death (Satgas COVID-19 RI, 2022).

Various COVID-19 countermeasures have been carried out through the Enforcement of Restrictions on Community Activities (PPKM) and prevention efforts or health protocols (using masks properly, maintaining distance, and washing hands with soap after doing activities). In addition to emphasising preventive behaviour, other efforts have been made to vaccinate against COVID-19 (Kementerian Kesehatan RI, 2021). WHO and CDC (Centers for Disease Control) stated that COVID-19 vaccines are safe and effective and recommend that people get a COVID-19 vaccine as soon as possible (CDC, 2023; WHO, 2022a).

Based on the Indonesian Ministry of Health's COVID-19 Vaccination Dashboard, the coverage of COVID-19 vaccination in Jambi Province on March 22, 2023, was 65.42% in the second dose and 27.29% in the third dose targeting the general public and vulnerable groups and 70.75% in the second dose and 31.43% in the third dose of all target groups (Kemenkes RI, 2023b). The coverage of COVID-19 vaccination in Jambi Province as of August 28, 2022, was 66.20% in the second dose and 35.41% in the third dose, while in Sei Penuh City, the coverage of the second dose vaccine was 53.6%, with the target population (Satgas COVID-19 Provinsi Jambi, 2022).

COVID-19 vaccination aimed to reduce deaths from COVID-19, COVID-19 with severe symptoms, reduce the overall disease burden, reduce the impact on health workers, and fully resume socio-economic activities (WHO, 2022b). This COVID-19 vaccination effort needs to pay attention to its coverage and equity in order to have an impact on COVID-19 control. COVID-19 vaccination efforts must focus on coverage and evenness to impact COVID-19 control. WHO and ITAGI (Indonesian Technical Advisory Group on Immunisation) recommend 70% COVID-19 vaccination coverage. (Kemenkes RI, 2021; WHO, 2022b). Vaccine acceptance is one of the critical factors in meeting the recommended COVID-19 vaccination outcomes. Some factors affecting COVID-19 vaccine acceptance include demographic factors (age, gender, education, and occupation), knowledge, perceived susceptibility to COVID-19, perceived severity of COVID-19 infection, perceived benefits, barriers, COVID-19 vaccine instructions, and self-efficacy (Abebe, Shitu, & Mose, 2021; Banik et al., 2021; Berg & Lin, 2021; Coe, Elliott, Gatewood, Goode, & Moczygemba, 2022; Detoc et al., 2020; Ishimaru et al., 2021; Malik, McFadden, Elharake, & Omer, 2020; Patwary et al., 2021; Wirawan, Harjana, Nugrahani, & Januraga, 2022).

The coverage of COVID-19 vaccination in Sei Penuh City, both the second and the third doses, must be increased while still implementing prevention efforts through health

protocols. Although there has been a decrease in cases in Sei Penuh City, transmission is still possible. It is because the COVID-19 problem is still a pandemic, and the possibility of new variants emerging can cause an increase in cases. Therefore, this study aimed to determine the determinants of COVID-19 vaccine acceptance in Sei Penuh City

METHODS

This study is analytic, using a cross-sectional research design using a rapid survey approach. We conducted this study in Sei Penuh City, Jambi Province, Indonesia, from July to August 2022. The sample in this study was people aged ≥18 years who lived in Sei Penuh City, with the inclusion criteria being people who lived and settled in Sei Penuh City for at least one year, and the exclusion criteria were not being at the research location during data collection, or in severe/infectious illness. The sample size used a sample size of two proportions hypothesis test to obtain a sample of 300 people. We used multistage random sampling. The first cluster was the village, and the second cluster was households. We chose the sample using Probability proportional to size (PPS), where one cluster consisted of ten respondents. Villages in this PPS are villages with COVID-19 vaccine coverage second dose less than 50%. We used C-Survey to conduct the PPS.

The dependent variable in the study was the acceptance of the COVID-19 vaccine (having received a second dose or more of the COVID-19 vaccine as evidenced by a vaccine certificate). The independent variables are age, gender, marital status, education level, occupation, family income, knowledge, health protocol, perceived susceptibility to COVID-19, perceived severity if infected with COVID-19, perceived barriers to getting the COVID-19 vaccine, perceived benefits of the COVID-19 vaccine, perceived instructions for getting the COVID-19 vaccine, and self-efficacy. The data used were primary data collected through interviews. Data were analysed descriptively using frequency distribution and analytically using the chi-square test and Cox regression. We used SPSS 23 to analyze the data. This study has received ethical eligibility issued by the Health Research Ethics Committee of the Jambi Ministry of Health Polytechnic with number LB.02.06/2/340/2022.

RESULTS

We present the results of the univariate analysis of this study in Table 1 and Table 2. Table 1 shows that most respondents are in the adult group (26-45 years) about 46%, married marital status about 73.3%, in the Jambi Malay ethnic about 99%, at a high level of education

about 64.7%, those work about 59.7%, and those whose income is Rp.2,000,000- Rp.5,000,000 about 31%, while based on gender the number is almost the same between male and female.

Table 2 demonstrates that most respondents have good knowledge (66.7%), middle susceptibility perceived to being infected with COVID-19 (67.3%), high severity perceived of infected with COVID-19 (63.3%), high perceived of benefits vaccine (69.3%), high perceived of barrier to getting a vaccine (51.7%), high perceived about instructions for getting a vaccine (57.7%), and have good self-efficacy (68%). Most respondents implemented health protocols in the poor category (84.7%). The respondents who had not received a second dose of vaccine based on acknowledgement and based on certificates were 37.7% and 58.3%, respectively.

Tabel 1. Characteristics of Respondents

Variabel	n	%
Age group		
Teenager (18-25 years)	53	17.7
Adult (26-45 years)	138	46.0
Elderly (>45 years)	109	36.3
Sex		
Male	152	50.7
Female	148	49.3
Marital status		
Married	220	73.3
Not Married	55	18.3
Widow/widower	25	8.4
Ethnic		
Melayu Jambi	297	99.0
Batak	1	0.3
Others	2	0.7
Education level		
Low	106	35.3
High	194	64.7
Employment status		
Not working	121	40.3
Working	179	59.7
Family income		
<Rp.500.000	22	7.3
Rp.500.000-Rp.1.000.000	36	12.0
Rp.1.000.000- Rp.1.500.000	66	22.0
Rp.1.500.000- Rp.2.000.000	76	25.3
Rp.2.000.000- Rp.5.000.000	93	31.0
Rp.5.000.000- Rp.10.000.000	7	2.3
Total	**300**	**100**

Table 3 shows the results of bivariate and multivariate analysis of determinants of vaccine acceptance in Sei Penuh City in 2022. The results of statistical analysis showed that there was an association between education level and vaccine acceptance with a PR value of 1.41 (95%CI: 1.17 to 1.69), which means that people with low education had a 1.4 times higher risk of not receiving the second dose of vaccine than those with higher education. Income was

also associated with vaccine receipt with a PR value of 1.55 (95%CI: 1.16 to 2.07), meaning that people with an income ≤ Rp.1,500,000 had a 1.5 times higher risk of not receiving the second dose of vaccine than those with an income > Rp.1,500,000.

Table 2. Distribution of Respondents Based on Knowledge and Perception

Variabel	n	%
Knowledge		
Poor	100	33.3
Good	200	66.7
Perceived of susceptibility		
Low	50	16.7
Middle	202	67.3
High	48	16
Perceived of severity		
High	209	69.7
Low	91	30.3
Perceived of Benefits		
Low	92	30.7
High	208	69.3
Perceived of Barrier		
High	155	51.7
Low	145	48.3
Perceived of Instructions		
Low	127	42.3
High	173	57.7
Self-Efficacy		
Less	96	32.0
Good	204	68.0
Health protocol		
Poor	254	84.7
Good	46	15.3
Vaccine Acceptance (Acknowledgement)		
Not yet or 1st dose	113	37.7
Has been second dose or more	187	62.3
Vaccine (Vaccine certificate)		
Not yet or 1st dose	175	58.3
Has been second dose or more	125	41.7

This study also found that knowledge was associated with vaccine acceptance, with a PR of 1.37 (95%CI: 1.14 to 1.64), meaning that people with poor knowledge were 1.4 times more likely not to receive the second dose of vaccine than those with good knowledge. The health protocol also showed an association with receiving the second dose of vaccine, with a PR of 1.68 (95%CI: 1.14 to 2.49), which means that people with poor health protocols have a 1.7 times higher risk of not receiving the second dose of vaccine than good category.

The results of the statistical analysis also showed that there was an association between perceived susceptibility to COVID-19 infection and receiving the second dose of vaccine, with a PR of 1.82 (95%CI: 1.04 to 3.17), which means that people who have a low susceptibility perceived have a 1.82 times higher risk of not receiving the second dose of vaccine than high

perceived. Self-efficacy also showed an association with receiving the second dose of vaccine, with a PR of 1.35 (95%CI: 1.12 to 1.62), which means that people with less self-efficacy have a 1.35 times higher risk of not receiving the second dose of vaccine than those with good self-efficacy. In this study, there was no relationship between age, sex, employment status, marital status, perceived severity, perceived benefits, perceived barrier, and perceived instructions with the acceptance of the COVID-19 vaccine.

The results of multivariate analysis showed that the factors influencing the acceptance of the second dose of the COVID-19 vaccine were education level and health protocols. The most dominant risk factor affecting the receipt of the second dose of vaccine in Sei Penuh City is health protocol, with an aPR value of 1.64 (95%CI: 0.99 to 2.70), which means that people with poor health protocols have a 1.6 times higher risk of not receiving the second dose of vaccine than those with good category, after controlling for education level.

DISCUSSION

This study shows that respondents who have received the second dose of the COVID-19 vaccine based on those who can show vaccine certificates are 41.7%. The coverage has yet to reach the target set by WHO and ITAGI (Indonesian Technical Advisory Group on Immunization), which recommends achieving 70% of COVID-19 vaccination (Kemenkes RI, 2021; WHO, 2022b). However, the study only examined villages where the percentage coverage of the second dose of the COVID-19 vaccine was less than or equal to 50% at the time of sample collection.

The results found that the health protocol factor or COVID-19 prevention behaviour is associated with the acceptance of the COVID-19 vaccine and is also the most dominant factor influencing the acceptance of the COVID-19 vaccine in Sei Penuh City. The analysis results obtained an aPR value of 1.64 (95%CI: 0.99 to 2.70), which means that people who carry out health protocols in the poor category are 1.6 times more likely not to receive the COVID-19 vaccine than good category, after controlling for education level. The health protocol variable in this study was assessed based on COVID-19 prevention behaviour known as "5M", namely washing hands with soap, using masks properly, maintaining distance, staying at home, and staying away from crowds. Furthermore, it was categorized into poor if the value was less than 75% and good if higher than or equal to 75%.

This study is consistent with a study in Ohio in 2021 which showed that adherence to COVID-19 prevention behaviour was related to receiving the COVID-19 vaccine, with aOR =

1.25 (95% CI: 1.15 to 1.37). People who do not adhere to COVID-19 prevention behaviours have a 1.2 times higher risk of not receiving the COVID-19 vaccine than those who adhere. We measured adherence to COVID-19 prevention behaviour by five questions, including wearing masks, regularly washing hands, and avoiding social gatherings, family gatherings, and crowded places (Haile, Ruhil, Bates, Hall, & Grijalva, 2022).

Table 3. Bivariate and Multivariate Analysis of Determinants of COVID-19 Vaccine Acceptance

Variable	Vaccine Acceptance				Total		PR (95% CI)	*p*	aPR (95% CI)	*p*
	Not accepted		Accepted							
	n	%	n	%	n	%				
Age group										
Teenager	70	64.2	39	35.8	109	100	1.26 (0.81-1.96)	0.307		
Adult	78	56.5	60	43.5	138	100	1.11 (0.72-1.72)	0.642	-	-
Elderly	27	50.9	26	49.1	53	100	Ref			
Sex										
Male	93	61.2	59	38.8	152	100	1.10 (0.91-1.34)	0.369	-	-
Female	82	55.4	66	44.6	148	100	Ref			
Education level										
Low	76	71.7	30	28.3	106	100	1,41 (1.17-1.69)	0.001	1.38 (1.02-1.86)	0.036
High	99	51.0	95	49.0	194	100	Ref			
Employment status										
Not working	67	55.4	54	44.6	121	100	0.92 (0.75-1.12)	0.462	-	-
Working	108	60.3	71	39.7	179	100	Ref			
Marital status										
Widow/widower	14	56.0	11	44.0	25	100	0.93 (0.43-1.62)	0.806	-	-
Not married	29	52.7	26	47.3	55	100	0.88 (0.58-1.31)	0.529	-	-
Married	132	60.0	88	40.0	220	100	Ref			
Family income										
≤ Rp.1.500.000	59	47.6	65	52.4	124	100	1.55 (1.16-2.07)	0.004	-	-
> Rp.1.500.000	54	30.7	122	69.3	176	100	Ref			
Knowledge										
Poor	71	71.0	29	29.0	100	100	1.37 (1.14-1.64)	0.003	-	-
Good	104	52.0	96	48.0	200	100	Ref			
Health protocol										
Poor	158	62.2	96	37.8	254	100	1.68 (1.14-2.49)	0.002	1.64 (0.99-2.70)	0.054
Good	17	37.0	29	63.0	46	100	Ref			
Perceived of susceptibility										
Low	36	72.0	14	28.0	50	100	1.82 (1.04-3.17)	0.035	-	-
Middle	120	59.4	82	40.6	202	100	1.50 (0.93-2.44)	0.100	-	-
High	19	39.6	29	60.4	48	100	Ref			
Perceived of severity										
High	124	59.3	85	40.7	209	100	1.06 (0.85-1.31)	0.687	-	-
Low	51	56.0	40	44.0	91	100	Ref			
Perceived of Benefits										
Low	53	57.6	39	42.4	92	100	0.98 (0.80-1.21)	0.966	-	-
High	122	58.7	86	41.3	208	100	Ref			
Perceived of Barrier										
High	96	61.9	59	38.1	155	100	1.14 (0.94-1.38)	0.234	-	-
Low	79	54.5	66	45.5	145	100	Ref			
Perceived of Instructions										

Low	76	59.8	51	40.2	127	100	1.05 (0.86-1.27)	0.737	-	-
High	99	57.2	74	42.8	173	100	Ref			
Self-efficacy										
Poor	68	70.8	28	29.2	96	100	1.35 (1.12-1.62)	0.004	-	-
Good	107	52.5	97	47.5	204	100	Ref			

The study results in the United States in 2020 also found that preventive behaviour was associated with accepting the COVID-19 vaccine. Preventive behaviours in this study were wearing masks and social distancing. The study found that people who kept their distance from the crowd/social distancing (aOR=0.22; 95%CI: 0.12 to 0.42) and were compliant in wearing masks (aOR=0.34; 95%CI: 0.21 to 0.54) had a lower risk of not being vaccinated (Latkin, Dayton, Yi, Colon, & Kong, 2021).

This study found that people who did not adhere to health protocols were less likely to receive the second dose of the COVID-19 vaccine. The proportion who did not receive a second dose of vaccine in the non-adhere (47.7%) was higher than those who complied with health protocols (28.9%). This result might be attributed to perceived susceptibility or vulnerability to the risk of being infected with COVID-19. Perceived susceptibility to COVID-19 infection is related to adherence to COVID-19 prevention behaviours (health protocol) and, ultimately, to acceptance of the COVID-19 vaccine. We did a further analysis and found that people with a high perception of the likelihood of being infected with COVID-19 are more likely to adhere to health protocols (PR= 3.64; 95%CI: 1.20 to 11.07). These results also show that socialization and education still need to be carried out, especially regarding the urgency of the COVID-19 vaccine in facing the COVID-19 pandemic.

This study also found that education level was associated with receiving the second dose of the COVID-19 vaccine, with an aPR value = 1.38 (95%CI: 1.02 to 1.86), which means that people who have a low level of education have a 1.3 times higher risk of not getting the second dose of COVID-19 vaccine than those with a high level of education, after controlling for health protocol variables. The results of this study are in line with the study conducted in Thailand in 2022, which showed that education level is a risk factor for receiving the COVID-19 vaccine, with an aOR value of 1.28 (95%CI: 1.04 to 1.57), which means that people who have high education (college) have a 1.2 times higher risk of receiving a COVID-19 vaccine than those with low education (high school graduate (Mueangpoon et al., 2022). The results of this study are also consistent with the study in Bali Province and DKI Jakarta Province in 2022 with aOR = 3.29 (95%CI: 2.31 to 4.70) and also research in Pekanbaru City in 2022 with a POR value of 3.145 (95%CI: 1.559 to 6.345) which indicates that education level is a risk factor for receiving

the COVID-19 vaccine (Rohmah, Alamsyah, Sari, Susmaneli, & Desfita, 2022; Wirawan et al., 2022).

The higher the education, the more likely it is to get the second dose of the COVID-19 vaccine. Education level can be related to vaccine acceptance because higher education is associated with better health behaviour. For example, in terms of paying greater attention to healthy habits, such as reducing the consumption of alcohol and tobacco and increasing the consumption of fruits and vegetables (Viinikainen et al., 2022; Taufik, 2022) . Education enables people to gain skills/ abilities and knowledge on general health, increasing their awareness of healthy and preventive behaviours, including COVID-19 prevention behaviours (health protocol) (Raghupathi & Raghupathi, 2020). Hence, efforts to increase the coverage of COVID-19 vaccinations may consider for groups with lower education, including in providing socialization and education on the COVID-19 vaccine.

CONCLUSIONS

The study found that 58.3% had not received the second dose of the COVID-19 vaccine (based on those who could show the vaccine certificate). The results of multivariate analysis showed that the determinants of receiving the second dose of the COVID-19 vaccine were health protocols and education level. The most dominant factor was prevention behaviour through health protocols. To increase the achievement of COVID-19 vaccination in Sei Penuh City, it is still crucial to conduct socialization and education, especially about the urgency of the COVID-19 vaccine in facing the COVID-19 pandemic. In addition, people with low education levels need more focussing on increasing the achievement of COVID-19 vaccination.

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