Determinan Terhadap Penyerapan Vasinasi Covid-19 Pada Lansia di Kecamatan Jagakarsa Jakarta Selatan

Determinants of Covid-19 Vaccination Uptake Among the Elderly in Jagakarsa Sub-District, South-Jakarta

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ABSTRACT

Background: COVID-19 is considered to be responsible for the emergence of a new dangerous outbreak. Therefore, it is expected that the interest in receiving vaccines will be very high. However, the lowest vaccination uptake rate comes from the elderly population. *Objective: To investigate determinants of COVID-19 vaccination uptake among the elderly.* *Methods: Cross-sectional design study. This research was conducted in Jagakarsa Sub-district from March to July 2021 with an online interview. The sample size was 393 from the total population study of 21,903. The sampling method was purposive sampling with independent variables namely gender, education level, knowledge, attitudes, government policy, health worker's recommendations, family support, access to COVID-19 vaccination service facilities, perceptions of COVID-19, and perceptions of COVID-19 vaccines. The dependent variable was COVID-19 vaccine uptake. Sample inclusion criteria included the elderly aged ≥ 60 years old and who lived in the Jagakarsa Sub-district. The exclusion criteria were those who were not willing to be respondents. This study conducted a univariate analysis to determine the frequency distribution of variables. Bivariate data analysis that was used were Chi-Square and multivariate data analysis with multiple logistic regression (a=0.05).* *Results: The results of the bivariate analysis showed that education, knowledge, perceptions of COVID-19 and COVID-19 vaccines, attitudes, government policies, access to COVID-19 vaccination service facilities, health worker's recommendations, and family support had a significant relationship with COVID-19 vaccine uptake. The results of multivariate analysis showed that the most associated factor was the perception of COVID-19 vaccine with AOR= 9,928 (95% CI: 5,386-18,302).* *Conclusion: Respondents had a high acceptance of COVID-19 vaccines, whereas most of the respondents were worried about the side effects at the same time. As our findings suggest, informing the elderly about forthcoming vaccines would help to build their trust in the COVID-19 vaccines.*

Keyword: COVID-19; COVID-19 vaccines; vaccine uptake; elderly

INTRODUCTION

Coronavirus Disease 2019, commonly known as COVID-19, is believed to be liable for an epidemic from Wuhan, Hubei Province, China since December 2019. As of 28 February 2021, World Health Organization (WHO) has reported 126 million cases and three million deaths due to the global spread of COVID-19 across 219 countries. The highest number of cases were reported from America, especially the United States of America in the first place. While the second rank was reported from a country in Asia, namely India (World Health Organization, 2021). The Asian region, especially Southeast Asia, was the second-highest region in the world with more than 34 million cases of COVID-19. Countries that contributed to this high number of cases were India with 29,823,546 cases (CFR = 1.3%) and Indonesia with 1,989,909 cases (CFR = 2.8%) (World Health Organization, 2021).

As the country with the second most reported COVID-19 cases in Southeast Asia, Indonesia has been highly, committed to implementing preventive behavior through 3M ("Memakai masker, Menjaga Jarak, dan Mencuci tangan"), 3T

("Tracing, Testing, dan Treatment"), and vaccination (Satuan Tugas Penanganan COVID-19, 2021). According to a previous study in 2021, over 90% of the community implemented the 3M attitude. However, the high mobility of the community on daily activities had accelerated the transmission of this virus. Thus a new, strategy arose to cut off the transmission of the virus from human to human through the concept of herd immunity and community protection, which was vaccination (Satuan Tugas Penanganan Covid-19, 2021).

The implementation of COVID-19 vaccination program in Indonesia began in two stages, namely stage 1 for groups of health workers, and stage 2 for the elderly and public officials. At this stage, the priority group's vaccine program was targeted at 40 million recipients. The dose 1 COVID-19 vaccination coverage for health workers and public officials had exceeded the national target. The success of this coverage was different for the elderly group, in which the coverage of dose 1 was 23.41% and 14% for dose 2 (Kementerian Kesehatan, 2021).

The low COVID-19 vaccine uptake in the elderly was a major obstacle in achieving the target of the COVID-19 vaccination in Indonesia. It was shown in the provinces within the Java-Bali region, considering the high transmission of COVID-19 among the elderly, especially in DKI Jakarta. Also, the provinces in the Java-Bali region had a vaccine proportion of 70% but was not able to achieve the elderly group vaccination target for four months of implementation. The following report found that dose 1 (65.3%) and 2 (58.7%) among the elderly were running slowly and were still far below the provincial target (Dinas Kesehatan Pemprov DKI Jakarta, 2021).

Jagakarsa Sub-district had the most elderly in South Jakarta with over twenty thousand people. Jagakarsa was also one of the five sub-districts with the highest cases of COVID-19 in DKI Jakarta (Sudin Kependudukan dan Pencatatan Sipil Jakarta Selatan, 2020). It was reported that COVID-19 vaccine uptake among the elderly in the Jagakarsa Sub-district was slow in reaching the target (Dinas Kesehatan Pemprov DKI Jakarta, 2021).

The delay of vaccination coverage programs was caused by the elderly's low desire to be vaccinated. The research conducted by the American Association of Retired Persons also stated that the increase of a person's age had an impact on decreasing a person's desire to be vaccinated. It was found that 69% of the elderly tended to have no desire to be vaccinated because they doubted the government (American Association of Retired Persons, 2020). In addition, the accelerated pace of vaccine development has contributed greatly to the public impression that the vaccine would not be adequately tested for safety and effectiveness (Karafillakis and Larson, 2017). According to a previous study in 2020, perceptions about vaccines influenced the willingness of the elderly to make decisions about whether to receive a COVID-19 vaccination (Sherman *et al.*, 2020). However, recommendations from health workers were considered helpful in alleviating elderly concerns about the safety and effectiveness of COVID-19 vaccines.

The previous research conducted in 2021 stated that knowledge was an important predictor of attitudes and behavior (Saiful Islam *et al.*, 2021). It was also an important component in developing an effective COVID-19 vaccination program strategy. In addition, family support factors had an important role in realizing the good health status of the elderly. Another factor related to receiving vaccines in the elderly was the access to COVID-19 vaccination service facilities based on distance, time, cost, and transportation needed by the elderly. This was because poor access could reduce the trust and interest of the elderly in this program and the vaccine itself (French *et al.*, 2020).

Regarding the delay of vaccination coverage programs among the elderly, the Indonesian Ministry of Health has urged local governments to be fully committed to overcoming conditions in the field (Kementerian Kesehatan, 2021). Although there has been no highly-effective vaccine yet and only a few proven effective treatments for COVID-19, various preventive measures need to be pursued Bults *et al.* (2020). Therefore, this program may be the best preventive measure in building immunity in the

community to eliminate the spread of COVID-19 in Indonesia. Based on the description above, a study was conducted to analyze the factors associated with covid-19 vaccination uptake among the elderly in Jagakarsa Sub-district.

METHODS

The research method that was used was quantitative analytics research with cross-sectional studies for the research design. It depicted community response at the point of the study. The population was all of the elderly who lived in the Jagakarsa Sub-district area. The minimum sample size was calculated using the Slovin formula, which was 393 respondents. Also, 393 respondents *from the total elderly population of 21,903* met the sample criteria and were taken as samples in this study by purposive sampling method. Sample inclusion criteria included the elderly aged ≥ 60 years old and lived in the Jagakarsa Sub-district. The exclusion criteria were those who were not willing to be respondents.

This research was conducted in March-July 2021 by taking primary and secondary data. Secondary data were from demographic data of the elderly collected by urban villages. Then, the primary data were obtained from online interviews by telephone or video calls and an online questionnaire with google forms.

The independent variables were gender, education level, knowledge, attitudes, government policy, health worker's recommendations, family support, access to COVID-19 vaccination service facilities, perceptions of COVID-19, and perceptions of COVID-19 vaccines. The dependent variable was COVID-19 vaccine uptake. All variables were descriptively analyzed using univariate. Also, the bivariate analysis was used to determine relationships between a dependent variable and independent variables. In the final analysis, multiple logistic regression was required to evaluate associated factors. This research has received ethical approval from the Ethics Committee of Universitas Pembangunan Nasional Veteran Jakarta No. 305/VI/2021/KEPK.

RESULTS AND DISCUSSION

Table 1. Descriptive Statistics for COVID-19 Vaccines Uptake among Elderly

Characteristics	N	%
COVID-19 Vaccine Uptake		
Yes[1]	246	62.6
No[2]	147	37.4
COVID-19 Vaccine Facilities[1]		
Puskesmas Kelurahan	37	15.0
Puskesmas Kecamatan	29	11.8
Public Hospitals	31	12.6
Private Hospitals	43	17.5
Other COVID-19 Vaccine Centers	106	43.1
Intention to take COVID-19 vaccines[2]		
Yes	38	25.9
No	109	74.1
Living Arrangements		
Living with family members	288	73.3
Living with partner	89	22.6
Living alone	16	4.1
Total	393	100

Vaccine is a measure to prevent or reduce the severity of many diseases and is important for people of all ages, including the elderly (University of Michigan, 2020). The COVID-19 vaccine is a drug that is injected to provide immunity against acute respiratory syndrome by SARS-CoV-2, the virus that causes the disease COVID-19 (Li *et al.*, 2020).

Table 1 shows that 246 (62.6%) respondents were already vaccinated. The majority of respondents (43.2%) who were already vaccinated received COVID-19 vaccine at COVID-19 vaccine service centers such as the Badan Usaha Milik Negara (BUMN) Istora Senayan vaccine center, Balai Besar Pelatihan Kesehatan (BBPK) Hang Jebat, and mobile vaccine service at schools and offices. The respondents were likely more interested in vaccination centers at the sub-district and urban village levels than in health facilities. On the other hand, 147 respondents who were unvaccinated reported that the majority did not intend to get COVID-19 vaccines. Compared to the younger age group, the elderly group had the lowest interest with only 1-3% (Kementerian Kesehatan, 2021). Also, the respondents were dominated by the elderly who lived with family members.

Table 2. Cross-tabulation for independent variables and COVID-19 vaccine uptake

Category	COVID-19 Vaccine Uptake						P-Value
	Yes		No		Total		
	n	%	n	%	n	%	
Gender							
Women	138	62,2	84	37,8	222	100	0,923
Men	108	63,2	63	36,8	171	100	
Educational level							
Degree level or above	88	85,4	15	14,6	103	100	0,000
Below degree level	158	54,5	132	45,5	290	100	
Knowledge							
Good	188	79,0	50	21,0	238	100	0,000
Insufficient	58	37,4	97	62,6	155	100	
Attitude							
Positive	214	76,4	66	23,6	280	100	0,000
Negative	32	28,3	81	71,7	113	100	
Perception of COVID-19							
Positive	149	75,3	49	24,7	198	100	0,000
Negative	97	49,7	98	50,3	195	100	
Perception of COVID-19 vaccine							
Positive	177	88,1	24	11,9	201	100	0,000
Negative	69	35,9	123	64,1	192	100	
Government policy							
Yes	214	72,8	80	27,2	294	100	0,000
No	32	32,3	67	67,7	99	100	
Access to vaccination facilities							
Yes	164	58,4	117	41,6	281	100	0,009
No	82	73,2	30	26,8	112	100	
Health worker's recommendations							
Yes	147	68,7	67	31,3	214	100	0,009
No	99	55,3	80	44,7	179	100	
Family support							
Good	160	77,7	46	22,3	206	100	0,000
Insufficient	86	46,0	101	54,0	187	100	

Based on the level of education, it shows that most (73.8%) respondents were below degree level. The majority of the respondents have completed formal education, which entailed high school and elementary school. The result of the bivariate analysis showed that p value= 0.000 (<0.05) indicating there was a significant relationship between education and COVID-19 vaccine uptake. This result is in line with a previous research in 2021 which stated that education had a significant relationship with greater public willingness to receive the vaccine (Nikolovski *et al.*, 2021).

Nevertheless, there were 238 (60.6%) of the 393 respondents who had a good knowledge about COVID-19 vaccines. It was because of the good support from their family that provided information about COVID-19 vaccine program. The study also found that there was a relationship between knowledge and vaccine uptake with a significance level of 0.000 (<0.05). Knowledge was considered to have an important role as a predictor of

attitudes and behavior, a crucial component in formulating an effective COVID-19 vaccination program strategy (Saiful Islam *et al.*, 2021).

This research found that 88.1% of respondents tended to have positive attitude towards COVID-19 vaccine uptake. The bivariate statistical test results obtained a value of p= 0.000 (<0.05) which meant there was significant relationship between attitude and COVID-19 vaccine uptake. The reason for receiving COVID-19 vaccine was self-protection and protecting close relatives. Over 70% of respondents wanted to get vaccinated without hesitation. According to the results of previous research conducted in 2021, the attitude towards vaccine uptake was composed of satisfaction, comfort, and trust in the COVID-19 vaccine (Sallam, 2021). The perception of COVID-19 disease was found to be significantly associated with vaccine uptake among the elderly. It was because the bivariate test obtained p value = 0.000 (<0.05). The results of the analysis showed that the more respondents

were worried about the spread of COVID-19 outbreak, the higher the acceptance of COVID-19 vaccine. Respondents who were very worried about getting COVID-19 were more likely to agree to take COVID-19 vaccine. It had a good impact on influencing the satisfaction factor which referred to the perception of the risk of being infected with the disease. So that someone would consider it was necessary to receive the vaccines. Meanwhile, the trust factor referring to the perception of COVID-19 vaccines was related to the safety of vaccination and the effectiveness of the vaccine, as well as the convenience factors were related to the availability, affordability, and convenient vaccination process.

This study also found that the perception of COVID-19 vaccines was significantly associated with vaccine uptake after a chi square test. The results of the test showed that p value = 0.000 (<0.05). Based on a previous research conducted in 2021, the theory of planned behavior identified three main factors that influenced the decision to receive COVID-19 vaccines (Cordina, Lauri and Lauri, 2021). The factors were a person's attitude towards vaccination in general and COVID-19 vaccines in particular, a person's attitudes towards vaccines that were considered important, and perceptions of behavioral control which referred to the perceived difficulty in carrying out an attitude, namely receiving vaccines. Attitudes towards COVID-19 vaccines were proven in this study to have a significant relationship.

A positive attitude towards vaccination can be encouraged through public policy initiatives. Through the government's mandatory COVID-19 vaccine program, the majority of respondents consider this as an obligation of citizens. It was found that there was significant relationship between government policy and COVID-19 vaccine uptake with a significance level of 0.000 (<0.05). This result is in line with previous research in 2020 which explained that acceptance of COVID-19 vaccine in the United States was lower if it was not recommended by the Health Service and the local Food and Drug Administration (Kreps *et al.*, 2020). However, most people did not consider themselves as a vulnerable group and they accepted the vaccine with a sense of trepidation.

In addition, the convenience of COVID-19 vaccine service facilities based on distance, time, cost, and means of transportation needed by the elderly from their place of residence was very affordable for 281 (71.5%) respondents. This was essential to achieve the program's success targets, where poor access could reduce trust and interest in program organizers and the vaccines themselves (French *et al.*, 2020). Based on the bivariate analysis, it was found that there was a relationship between access to vaccination facilities and COVID-19 vaccine uptake with a significance level of 0.000 (<0.05). Respondents with very affordable access to COVID-19 vaccine service facilities had a higher tendency to receive COVID-19 vaccines. This was also evidenced by the place chosen by the majority of respondents, which was another COVID-19 vaccine center. COVID-19 vaccine centers such as the Badan Usaha Milik Negara (BUMN) Istora Senayan vaccine center, Balai Besar Pelatihan Kesehatan (BBPK) Hang Jebat, and mobile vaccine service at schools and offices were chosen by the elderly because of the ease of access and administration. Respondents also preferred vaccination centers at the sub-district and urban levels to get vaccinated against COVID-19 compared to doing it at health facilities.

Otherwise, the elderly's high trust in the health provider was associated with the use of preventive health services such as vaccination. The results of the assessment were p value= 0.009 (<0.05). In this study, respondents who believed in the recommendations of health workers were four times more likely to receive COVID-19 vaccines. Public skepticism about vaccines was closely linked to a distrust of medical evidence. It could be overcome according to previous research in 2021 which explained that 67.7% of the elderly who were vaccinated against COVID-19 stated they received advice from doctors and medical professionals before deciding to get vaccinated (Malesza and Bozym, 2021). The public's doubts could be appeased by health workers through counseling and messages dissemination referring to the government policies. Therefore, the recommendations of health workers, especially medical personnel, were an important factor in people's decision-making to receive COVID-19 vaccines.

Table 3. Multiple Logistic Regression Predicting the Likelihood of COVID-19 Vaccine Uptake among the Elderly.

Variable	B	SE	P Value	Exp (B)	95% CI Lower	95% CI Upper
Educational level	1,176	0,397	0,003	3,241	1,487	7,062
Knowledge	0,981	0,307	0,001	2,667	1,460	4,873
Perceptions of COVID-19 vaccines	2,295	0,312	0,000	9,928	5,386	18,302
Attitude	1,069	0,341	0,002	2,913	1,492	5,687
Government policy	1,091	0,343	0,001	2,976	1,520	5,827
Access to COVID-19 vaccination service facilities	-1,038	0,359	0,004	0,354	0,175	0,716
Family support	0,861	0,318	0,007	2,365	1,269	4,409

The majority of the research respondents had sufficient family support to make decisions about the acceptance of COVID-19 vaccines for the elderly. Respondents with good family support were 4,085 times more likely to receive COVID-19 vaccines than respondents with less family support. Attitudes and perceptions of other key people were identified as important factors to influence vaccine uptake. A strong positive correlation was found between family support and COVID-19 vaccination uptake with a significance level of 0.000 (<0.05).

Table 3 shows the multiple logistic regression model after adjustments of variables namely educational level, knowledge, attitude, perception of COVID-19 vaccine, government policy, access to COVID-19 vaccination facilities, and family support. Out of ten independents variables, gender, perception of COVID-19, and health worker's recommendations were excluded. The results of multiple logistic regression test showed that perceptions of COVID-19 vaccines were significantly associated with COVID-19 vaccine uptake (p= 0.000). The likelihood of being vaccinated was the highest among the elderly with positive perceptions of COVID-19 vaccine. The elderly with positive perceptions were 9,928 times as likely to receive COVID-19 vaccine compared with those who had negative perception after controlling by the variables of education, knowledge, attitudes, government policies, access to COVID-19 vaccination facilities, and family support (AOR= 9,928; 95% CI: 5,386-18,302).

This result was in line with a previous study in 2021 which classified the perceptions of COVID-19 vaccines based on the susceptibility, benefits, barriers, and self-efficacy of the vaccines; which had a significant relationship with COVID-19 vaccine uptake (Guidry *et al.*, 2021). The positive perceptions of COVID-19 vaccines had been explained in various studies using the health belief model (HBM) theory which consists of perceived susceptibility, perceived severity, perceived benefits, and perceived barriers, and successfully explained 66% of the variance of COVID-19 vaccine uptake and provided a useful framework (Guidry *et al.*, 2021). The COVID-19 vaccine perception factor associated with COVID-19 vaccine uptake in this population is belief about safety. This positive perception can explain the high COVID-19 vaccine uptake among the elderly in Jagakarsa Sub-district. It is because they had a strong perception of the benefits of vaccination compared to the risks according to the HBM.

This research had the limitation that the cross-sectional study was not able to explain the cause-and-effect relationship of the variables. It is because there was no clear time sequence between exposure and outcome. The secondary databases from sub-district and urban village levels were not completely available. Therefore, the purposive sampling method was chosen even though it was not representative. So, a more representative sampling method will be required to investigate the actual elderly's perspectives on COVID-19 vaccine uptake in the future. The final limitation concerns about the respondent's answer could be unstable. Any possibility might cause a change in the respondent's opinion about the vaccination program.

CONCLUSION

This study revealed that positive perceptions towards the COVID-19 vaccines were significantly associated with COVID-19 vaccine uptake. It was found that the

elderly had a high acceptance of the COVID-19 vaccines, although some respondents were still worried about the side effects. As our findings suggest, informing the elderly about forthcoming vaccines helped to build positive perceptions and attitudes towards the vaccination program and the vaccines themselves. In that case, the government should focus on spreading a public policy that is easy-to-understand on the effectiveness, safety, and convenience of receiving the COVID-19 vaccine. Also, it could be supported by Health workers who maintain communication on the benefits related to the COVID-19 vaccination uptake. On the other hand, family could be a source of information that the elderly trusted the most. The COVID-19 vaccination service facilities should be less than thirty minutes from the elderly's residence. Furthermore, mobile vaccination facilities should be widened so it would provide easier access.

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