KNOWLEDGE AND PERCEPTION OF UNVACCINATED PEOPLE TOWARDS COVID-19 VACCINE IN BOGOR, INDONESIA.

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Abstract **Background**: The Indonesian government had been implementing a vaccination program since early 2021. Bogor Regency is one of the areas with a relatively low vaccination coverage compared to other areas in West Java. This phenomenon could be influenced by perceptions based on public knowledge of the Covid-19 vaccine.
Method: A cross-sectional study was conducted between May and July 2022. Unvaccinated people data was collected from Tamansari Public Health Center and the minimum sample size was determined using a 5% alpha error. Total 154 participants were enrolled in this study, with inclusion criteria: age >18 years old, had not received covid-19 vaccination, able to communicate, and willing to participate. Knowledge and perception were measured by a valid and reliable questionnaire. The correlation between knowledge and perception was analyzed using Spearman's test, p<0,05 considered significant.
Objectives: This study aimed to evaluate the knowledge and perceptions of unvaccinated people towards Covid-19 vaccination in Tamansari Public Health Center working area, Bogor.
Results: The present study reported that 100% of participants were not willing to get vaccinated. Demographic data showed that the educational background of most of the participants is an elementary school (88,3%). Knowledge assessment towards Covid-19 vaccination showed that 63,6% of participants had poor knowledge of Covid-19, meanwhile, 32,5% and 3,9% of others had moderate and good knowledge, respectively. The majority of the participant had a negative perception towards Covid-19 vaccination (51,95% very negative, 38,96% negative). The top three negative perceptions opined by participants were Covid-19 vaccination would not affect their health during the pandemic era, hesitant about Covid-19 vaccine effectivity in preventing Covid-19, and afraid that Covid-19 vaccination could induce illness (scored 4,63; 4,49; and 4.47 of 5.00, respectively). ow level of knowledge significantly correlated with negative perception (p<0.05) towards Covid-19 vaccination with a correlation coefficient is 0.404 (moderate).
Conclusion: This study concluded that poor knowledge could affect the negative perception towards Covid-19 vaccination, which may be contributed as a barrier to the Covid-19 vaccination program. Our findings may provide information for the authorities and stakeholders to promote and improve knowledge and perceptions towards COVID-19 vaccination among unvaccinated people.
Keywords: HIV/TB coinfection; treatment outcomes, factors.

BACKGROUND

The Covid-19 pandemic occurs throughout the world since 2020, including in Indonesia. Covid-19 virus was discovered at the end of December 2019 in Wuhan City, China (1). The Indonesian government has tried multiple approach to suppressed Covid-19 cases by implementing, one of its major programs was Covid-19 vaccination since early 2021. This program was aimed to reduce the rate of Covid-

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19 transmission, reduce morbidity and mortality, sustain herd immunity, and protect the community from Covid-19. The target number of Covid-19 vaccination coverage was 75% by the end of 2021 (2). Based on vaccination data distribution by the Ministry of Health, the vaccination coverage had reached 68.33% (1st dose) and 47.49% (2nd dose) by December 2021. As for West Java, the number was lower (67.04%). This results that the Covid-19 vaccination program had not yet met the provincial target.

The poor level of public participation in Covid-19 participation could be attributed by several factors attributed in shaping the public perceptions towards the Covid-19, such as public concerns and distrust of safety and effectiveness of the vaccine, and halal status of the vaccine (Kemenkes RI, 2020). Several other factors that influenced the perception were: knowledge, age, education, occupation, culture, economy, environment, and the validity of information circulating in the community. To overcome these barriers, healthcare providers play a critical role to provide promotive and preventive efforts to ensure the efficiency and effectiveness of Covid-19 vaccination despite the diversity of perceptions that exist (3). Knowledge was a major factor needed to achieve a successful of the Covid-19 vaccination program (4,5).

Data provided by Indonesian Covid-19 Task Force in 2021 showed that Bogor became one of the areas with relatively low vaccination coverage compared to other areas in West Java, which only 57.45% of the provincial target. Since Bogor was provided by adequate access to the vaccine distribution process, the problem in this area was not attributed by vaccines' access and availability. The low coverage of Covid-19 vaccination in Bogor Regency could be influenced by public interest in participating the vaccinations which affected by perceptions based on public knowledge of the Covid-19 vaccine. Thus, this study was aimed to evaluate the knowledge and perceptions of unvaccinated people towards Covid-19 vaccination in the working area of the Tamansari Public Health Center (PHC), Bogor in 2022.

METHODS

Study setting and design

The study was conducted using observational study design with a cross sectional approach. The study was conducted by distributing questionnaires as a primary data collection instrument to respondents to determine the public knowledge and perceptions of the Covid-19 vaccine in the Tamansari Public Health Center (PHC), Bogor, Indonesia in March-May 2022.

Study population and sampling procedure

Study population was resident under Tamansari PHC working area in Bogor. Inclusion criteria was: age >18y.o.; unvaccinated (1st dose, 2nd dose, booster); communicate well; and willing to participate in this study. Exclusion criteria was respondents who did not complete the questionnaire. The necessary sample size (n) was computed by Slovin formula [$n = N / (1 + Nd^2$] assuming 95% confidence level. The calculated sample was 150 subjects. Sample was determined using purposive sampling technique.

Data Collection and Variable measurement

The data collection was performed using primary data by interviewing the respondents. Instrument used was a valid and reliable questionnaire developed by researcher. The instrument consisted of a research approval sheet, characteristic baseline, and specific questions to determine respondents' knowledge (22 questions) and perception (19 questions) related to the Covid-19 vaccination.

Knowledge was measured using the Guttman scale (minimum score 0, maximum score 1). After data processing, Knowledge level was categorized into 3 categories: good (77-100%), moderate (56-76%), poor (< 56%). Perception was measured using Likert scale (minimum score 1, maximum score 5). Level of perception was divided into 4 categories: Very positive (Quartile 3 - Maximum score), Positive (Median ≤ x < Quartile 3), Negative (Quartile 1 x < Median), Very negative (Minimum - Quartile 1).

Univariate analysis was performed to determine the characteristics of the respondents (age, gender, educational background, occupation, history of covid-19, history of disease, willingness to receiving the Covid-19 vaccination), and level of knowledge and perception of the Covid-19 vaccine. Bivariate analysis was performed using Spearman analysis to determine the correlation between knowledge and perceptions about the Covid-19 vaccine in 95% confidence interval.

Ethic Consideration

The studies involving human participants were reviewed and approved by the Research

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Ethic Committee from Poltekkes Kemenkes Bandung (No. No. 78/EC/II/2022). The participants provided their written informed consent to participate in this study.

RESULT AND DISCUSSION

Table 1 showed the demographic data of the respondents. Majority respondents were in productive age group (17-45 years old) women with elementary school education background, and lived as a housewife (72.70%). 79.20% of respondents stated that they did not have a history of Covid-19 infection during interview, meanwhile 20.68% of respondents stated that they did not know their history of Covid-19 infection. In addition, as many as 35.71% of respondents stated that they had a history of disease, while as many as 64.29% of respondents stated that they did not have a history of disease. As for the willingness to received vaccinations, 100% of respondents stated that they were not willing to take part in the Covid-19 vaccination (both vaccine dose one, dose two vaccine, and booster vaccine).

Table 1. Demographic Characteristic of Respondents

Demographic Characteristic	Frequency (n)	Percentage (%)
Age		
17 – 25 y.o	36	23,40
26 – 35 y.o	38	24,70
36 – 45 y.o	37	24,00
46 – 55 y.o	20	13,00
56 – 65 y.o	17	11,00
>65 y.o	6	3,90
Sex		
Man	34	22,08
Woman	120	77,92
Educational Background		
Elementary school	136	88,30
Junior High School	13	8,40
Senior High School	5	3,20
Occupation		
Housewives	112	72,70
Enterpreneur	10	6,50
Laborer	32	20,78
History of Covid-19 Infection		
Yes	0	0,00
No	122	79,20
Unknown	32	20,80
Willingness to receive Covid-19 Vaccination		
Yes	0	0,00
No	154	100,00
Unknown	0	0,00
Total	154	100,00

Table 2 showed the proportion of knowledge and perception level of respondents. It can be seen that the majority of respondents have a poor level of knowledge (63.63%), while only 3.90% respondents with a good level of knowledge. The majority of respondents also had a negative perception towards Covid-19 vaccination (51.95% very negative; 38.96% negative). Respondents with negative perceptions were dominated by the elderly. This is in line with research conducted by Reiter, et al (2020) which concluded that age is a factor in making a decision to receive Covid-19 vaccination (6). In addition, this study also found that health problem (comorbidities, such as diabetes, hypertension, and lungs problem) was one of factors causing hesitation among elderly to receive Covid-19.

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Table 2. Level of Knowledge and Perception of Covid-19 among Respondents

Parameter	Level	Frequency (n)	Percentage (%)
Knowledge	Poor	98	63,63
	Moderate	50	32,47
	Good	6	3,90
Perception	Very Negative	80	51,95
	Negative	60	38,96
	Positive	13	8,44
	Very positive	1	0,65
	Total	154	100

One of the principal factors associated with attitude towards and perception of COVID-19 vaccination is educational background. The present study showed that people with higher education had a more positive perception than those who graduated from an elementary school or below. This is in line with prior research from the United States, which showed that individuals with higher education were considerably more likely to believe in the safety and efficacy of the vaccine and to receive a COVID-19 vaccine (7). Negative perception is also dominated by male respondents (41.17%). This study concluded that female respondents have better perceptions about Covid-19 vaccination compared to male respondents. Although woman has a better perception towards Covid-19 vaccination, several studies showed that hesitancy to get vaccination is higher in woman compared to man. One possible explanation of the gender gap is concerns about how COVID-19 vaccines affect and interact with conception, pregnancy and breastfeeding. Another hypothesis refers to the alleged higher use of women of online social networks for health-related information. Given that a lot of misinformation related to COVID-19 and vaccines has been spreading via online networks. It is possible that this can account for the gender gap in vaccine hesitancy (8,9).

Table 3 showed the top 10 of negative perception towards covid-19 vaccination among respondents. Majority of respondents had a negative perception towards effectivity and safety of covid-19 vaccine. Interestingly, this study also found that some respondent also afraid of chip embedded in vaccine. Lack of knowledge and mistrust towards vaccines represent a challenge in achieving the vaccination coverage required for population immunity. Amongst the barriers to universal vaccination, misinformation regarding the benefits, medicinal composition and adverse effects of vaccination limits patient understanding, and the increase in antivaccination movement was mainly caused by believes that vaccinations do more harm than good to children, especially in case of connecting vaccination with autism (10).

Table 3. Top 10 of Negative Perception among Respondents (n=154)

Scope	Parameter	Mean Average Score[a]
Effectivity	Unsure that Covid-19 vaccination will affect overall health	4.63
	Unsure that Covid-19 vaccination can protect Covid-19 infection	4.49
	Unsure about vaccine effectivity	4.36
Safety	I'm afraid that Covid-19 vaccination can induce illness	4.47
	Afraid of Vaccine's side effect	4.34
	Unsure of Covid-19 vaccine safety	4.27
	Afraid there are chip embedded in vaccine	4.22
Information	Validity of information about Covid-19	4.32
Availability	There are too many Covid-19 vaccines available in the market	4.40

[a]minimum score 1, maximum score 5.

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Crosstabulation between knowledge and perception are displayed in Table 4. Majority of respondents with poor knowledge had a negative perception towards Covid-19 vaccination (63,20%). The negative perception towards Covid-19 vaccination may be attributed by public concerns and anxiety in the Covid-19 vaccine. The riskiest group being young females, people who had suspected cases of COVID-19, and those with less satisfying social support. Nevertheless, health workers were found to have a lesser risk of developing anxiety. Accessible information and healthcare, social connection, supportive environment, and mental health surveillance are important to prevent bigger psychiatric problems post-pandemic (11). Another study concluded that here was a significant association between anxiety and unwillingness to receive the vaccine. These findings suggest that to increase vaccination intention and reduce the public anxiety, it is necessary to educate and create a mental health support system (12).

Table 4. Crosstabulation of Knowledge and Perception towards Covid-19 Vaccination

Knowledge Category	Perception Category				Total
	Very negative n (%)	Negative n (%)	Positive n (%)	Very positive (%)	
Poor	62 (63,26)	34 (34,70)	1 (1,02)	1 (1,02)	98 (100,00)
Moderate	16 (32,00)	23 (46,00)	11 (22,00)	0 (0,00)	50 (100,00)
Good	2 (33,33)	3 (50,00)	1 (8,44)	0 (0,00)	6 (100,00)

Further analysis was performed using bivariate statistic (Spearman's rho analysis) to determine the correlation between knowledge and perception of respondents (Table 5). Spearman's analysis showed that there is a significant positive correlation between knowledge and perception towards Covid-19 vaccination (spearman ρ +0,404; $p<0.01$). It can be concluded that respondent with higher score of knowledge have a better perception towards Covid-19. This result is in line with several studies in Malaysia, Bangladesh, and Saudi Arabia (13,14, 15).

Table 5. Spearman Correlation between Knowledge and Perception towards Covid-19 Vaccination

Variable	p-value	Spearman ρ	Interpretation
Knowledge Perception	0.000**	+ 0.404	Moderate relationship

**statistically significant at p=0.01 (n=154)

Besides pharmacist's role in vaccine logistics and supply and preparation prior to administration, pharmacist also plays a critical role in education and training of healthcare professional and patients, involvement in critical care of COVID-19 patients, participation in clinical trials and facilitation of routine clinical services during the pandemic (16). Pharmacists also have a role in helping to overcome Covid-19 vaccine hesitancy, in countering some of the myths through patient education to hopefully increase acceptance of the vaccine. By explaining and promoting the benefits of vaccination, and by tailoring the message in a clear and comprehensive way, pharmacists can reassure individuals and allay any concerns about being vaccinated (17).

CONCLUSION

There is a positive correlation between the knowledge of unvaccinated people and the perception about Covid-19 in Tamansari, Bogor, Indonesia with moderate correlation ($r=0.404$, $p<0.01$). Pharmacist may provide an accurate

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and comprehensive information about Covid-19 vaccination to increase the level of knowledge, perception, and acceptance covid-19 vaccination.

COMPETING INTERESTS

All authors had none to declare

AUTHOR'S CONTRIBUTION

Widyastiwi conceived of the presented idea, data analysis, and writing manuscript; Miselia Kusumanita was in charge of data collection and analysis; and drafting the manuscript. All authors contributed to the final manuscript.

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