Gac Méd Caracas 2023;131(4):944-951
DOI: 10.47307/GMC.2023.131.4.16

Behaviors Linked to the Acceptance of Vaccinations Aiming to Expedite COVID-19 Management Within the Citta Sub-District of Soppeng District, Indonesia

Comportamientos Asociados con la Aceptación de la Vacunación como un Esfuerzo para Acelerar El Manejo del COVID-19 en el Sub-Distrito De Citta, del Distrito De Soppeng, Indonesia

Musdaliva Tri Riskiani Almin[1a*], Nur Nasry Noor[2b], Ansariadi[3b], A. Arsunan Arsin[4b], Hasanuddin Ishak[5c], Sudirman Natsir[6d]

SUMMARY

Background: *COVID-19 is a respiratory disease that spread massively in 219 countries leading to a pandemic. Vaccination is a prevention strategy in the epidemiology approach by analyzing behavioral determinants related to vaccination acceptance of COVID-19. This study aims to analyze the association between behavioral determinants with the vaccination's acceptance of COVID-19 in Citta District, Soppeng Regency.* **Method:** *A cross-sectional study design was carried out on 333 people. Cluster sampling was applied as the sampling technique. Data analysis used the Chi-Square test and logistic regression.* **Results:** *A significant relationship was found between behavioral determinants and acceptance of the COVID-19 vaccine, including access to information (p=0.013) and the role of health workers (p=0.003). Whereas gender, education, occupational, knowledge, attitudes, and family support were not related to the COVID-19 vaccination acceptance. Multivariate analysis results showed that access to information (p=0.004: OR 2.129: 95 % CI: 1.272-3.563) and the role of health workers (p=0.001: OR 0.444: 95 % CI: 0.278-0.707) were most related with the 1st booster COVID-19 vaccination effectiveness.* **Conclusion:** *The role of health workers associated with COVID-19 vaccination acceptance is related to the information that can be obtained and accessed by the community.* **Suggestions:** *It is expected that health workers will act more actively in capturing the public and be more informative and open to the public regarding information.*

Keywords: *Vaccine-Acceptance, COVID-19, Behavior, Information.*

DOI: https://doi.org/10.47307/GMC.2023.131.4.16

ORCID: https://orcid.org/0009-0000-0742-7689[1]
ORCID: https://orcid.org/0009-0009-4115-8940[2]
ORCID: https://orcid.org/0000-0002-9692-6136[3]
ORCID: https://orcid.org/0000-0003-3311-6686[4]
ORCID: https://orcid.org/0000-0001-9802-1501[5]
ORCID: https://orcid.org/0000-0002-9735-1178[6]

Recibido: 1 de septiembre 2023
Aceptado: 10 de octubre 2023

[a]Master of Epidemiology Study Program, Faculty of Public Health, Hasanuddin University, Indonesia
[b]Department of Epidemiology, Faculty of Public Health, Hasanuddin University, Indonesia
[c]Department of Environmental Health, Faculty of Public Health, Hasanuddin University, Indonesia
[d]Department of Health Promotion, Faculty of Public Health Hasanuddin University, Indonesia

*Corresponding Author: Email: musdalivatririskianialmin@gmail.com)

RESUMEN

Antecedentes: *La COVID-19 es una enfermedad respiratoria que se propagó ampliamente en 219 países, lo que llevó a una pandemia. La vacunación es una estrategia de prevención en el enfoque epidemiológico al analizar los determinantes conductuales relacionados con la aceptación de las vacunas contra la COVID-19. Este estudio tiene como objetivo analizar la asociación entre los determinantes conductuales y la aceptación de las vacunas COVID-19 en el Distrito de Citta, Regencia de Soppeng.* **Método:** *Se llevó a cabo un diseño de estudio transversal con un total de 333 personas. Se aplicó un muestreo por conglomerados como técnica de muestreo. El análisis de datos utilizó la prueba de Chi-Cuadrado y la regresión logística.* **Resultados***: Se encontró una relación significativa entre los determinantes conductuales y la aceptación de la vacuna COVID-19, incluido el acceso a la información (p=0.013) y el papel de los trabajadores de la salud (p=0.003). Mientras que el género, la educación, la ocupación, el conocimiento, las actitudes y el apoyo familiar no se relacionaron con la aceptación de la vacuna COVID-19. El resultado del análisis multivariante mostró que el acceso a la información (p=0.004: OR 2.129: IC del 95 %: 1.272-3.563) y el papel de los trabajadores de la salud (p=0.001: OR 0.444: IC del 95 %: 0.278-0.707) estaban más relacionados con la efectividad de la primera dosis de la vacuna COVID-19.* **Conclusión***: El papel de los trabajadores de la salud se asocia con la aceptación de la vacuna COVID-19, lo que se relaciona con la información que la comunidad puede obtener y acceder.* **Sugerencias:** *Se espera que los trabajadores de la salud actúen de manera más activa para captar al público y sean más informativos y abiertos al público en cuanto a la información.*

Palabras clave: *Aceptación de la vacuna, COVID-19, comportamiento, información.*

INTRODUCTION

The World Health Organization (WHO) reports that globally the number of confirmed cases of COVID-19 is 276 436 619 people with a total death of 5 374 744 people or a mortality rate of 1.9 %. Based on WHO data, it was known that there were 219 countries infected with coronavirus with 180 of them experiencing local transmission (1).

Globally, the number of COVID-19 cases in women and men is relatively the same, namely 50.4 % and 47.6 %, respectively. In Southeast Asia itself, the number of confirmed COVID-19 cases was 44 865 441 people with a total death of 718 368 people or with a mortality ratio of 1.6 %. As of December 26, 2021, based on data from the Ministry of Health of the Republic of Indonesia, it was known that the number of confirmed cases to date is 4 261 759, with a cure rate of 96.5 % or 4 113 049 people and the number of cases that have died is 144 055 people or with a percentage of 3.4 % and active cases of 0.1 % or as many as 4 655 cases (2).

According to data from South Sulawesi on the COVID-19 response, the number of confirmed cases in Soppeng regency was 2 397 cases with a total recovery percentage of 97.2 % or 2 331 recovered cases and 66 deaths or 2.8 %. In addition, based on data from the Indonesian Ministry of Health, the Soppeng district is one of the regions experiencing local transmission. In handling and preventing COVID-19 disease, the government is currently massively protecting the community by launching programs such as 5M (using masks, maintaining distance, washing hands, avoiding crowds, and reducing mobility), 3T (testing, tracing, and treatment) as well as vaccination. These efforts are made to protect and guard people from the spread of the coronavirus.

Vaccination is considered one of the government's efforts to form immunity against existing viruses. COVID-19 vaccination aims to form antibodies resistant to the coronavirus (3). Vaccination is carried out to form herd immunity as one of the efforts to control and prevent COVID-19. The expected vaccination coverage is 70 %-80 % to create herd immunity (4).

Based on data from the Ministry of Health, the coverage of the 3rd dose of COVID-19 vaccination in Indonesia, as of September 27, 2022, had reached 26.98 % (Ministry of Health, 2021). Based on WHO data, only around 39.44 per 100 population have received the complete dose of vaccine from January 13th, 20221 to December 20th, 2021 (World Health Organization (WHO), 2021). COVID-19 vaccination coverage with the 3rd dose in South Sulawesi Province reached 14.26 % as of September 27, 2022. Vaccination coverage in Soppeng for the first dose of vaccine was 87.43 % the second dose was 69.61 % and the third dose third at 15.99 % as of September 27, 2021 (Ministry of Health, 2021) (6).

Based on the latest data on the achievements of the COVID-19 vaccination in every district in Soppeng Regency on March 30th, 2022, it was found that there were three districts with low vaccination achievement, namely Citta District, Liliriaja District, and Gandra District. Citta District was the district with the lowest vaccination, with the achievement of vaccine dose 1 was 76.04 %, vaccine dose 2 was 48.71 %, and dose 3 was 4.58 % (Soppeng Regency Government, 2022) (7).

Vaccination efforts carried out by the government received various responses in the Soppeng community, including areas with high vaccination coverage rates in South Sulawesi. Yet, this high coverage was not contributed by every district as happened in Citta District where the coverage of the 3rd dose vaccine is still low at 4.58 %.

Community behavior in receiving vaccinations is a determinant that affects the achievement of the expected target of the 3rd dose of vaccination. Lawrence Green's Behavior Change Theory (1980) explained that behavior change is influenced by three factors, namely predisposing factors such as age, education, occupation, attitudes, actions, and so on. It is supporting factors such as support for access to information facilities and infrastructure — reinforcing factors such as family support and the role of health workers (8).

The study conducted by the Determinants of Community Willingness to Receive COVID-19 Vaccination in Central Sulawesi showed that the factors influencing people's willingness to receive the Central Sulawesi COVID-19 vaccination such as age, occupation, marital status, religion, and ethnicity had a relationship with vaccines acceptance in the community. Meanwhile, based on the logistic regression multivariate test results, it was shown that Supporting factors and religion are the determinants most related to people's willingness to receive the COVID-19 vaccination in Central Sulawesi (9).

Another study regarding the analysis of COVID-19 vaccination acceptance among the community shows that acceptance of vaccines in the community is influenced by knowledge, availability of access to information, and family support for COVID-19 vaccination acceptance (10).

As one of the areas in Soppeng District with low coverage of the 3rd dose of vaccination, the study aimed to examine the community behavior towards vaccination, especially the relationship between the behavioral determinants and the vaccination acceptance in the community in Citta District, Soppeng Regency.

MATERIALS AND METHODS

This study implemented an analytic observational study with a cross-sectional study design and was conducted in Citta District, Soppeng Regency.

The sample was 333 people. Data was collected from COVID-19 vaccination coverage using questionnaires. Cluster sampling was applied as the sampling technique, with inclusion criteria, namely residents of Citta District, aged 18-60 years, willing to become informants and have carried out the 2nd dose of COVID-19 vaccination.

This study used secondary data from vaccination coverage reports for each sub-district in Soppeng Regency and primary data in the form of a questionnaire containing demographic data and the variables studied.

Granting permission to conduct the study was obtained through a certificate from the Department of Epidemiology, Faculty of Public Health, Hasanuddin University with number: 21273/UN4.14.1/PT.01.04/2023. Further, in conducting this study, the researchers also obtained approval from the Ethic Committee of the Hasanuddin University Health Faculty with the number: 3267/UN4.14.1/TP.01.02/2023 on April 10, 2023.

Data Analysis

Data processing and analysis were carried out using the SPSS version 24 program. Bivariate analysis using the Chi-Square test was implemented to find out which variables

had a significant relationship with COVID-19 vaccination acceptance and multivariate analysis using multiple logistic regression tests with the enter method was also applied to find out which variables were most related to the COVID-19 vaccination acceptance.

RESULTS

Sample Characteristics

Table 1 shows that respondents have almost the same proportion of females (49.8 %) and males (50.2 %). Most of the respondents are aged 18-29 years (15.3 %). Most respondents (36.0 %) did not finish school/elementary school. Most of the respondents (31.5 %) work as housewives.

Table 1

Respondents' Demographic Characteristics

Characteristics	**N**	**%**
Gender		
Male	167	50.2
Female	166	49.8
Age group (Year)		
<=29	148	44.4
30-49	134	40.2
>=50	51	15.3
Level of determinant o		
Primary education	120	36,0
Secondary Education	103	30.9
Higher Education	51	15.3
Undergraduate/ Bachelor/Master	59	17.7
Occupation		
Farmer	92	27.6
Civil Servant	32	9.6
Employed in the private sector	70	21.0
Learner	34	10.2
Housewife	105	31.5
Booster Vaccine Acceptance		
Yes	133	39.9
No	200	60.1

Table 2 shows that most of the respondents (75.1 %) have less knowledge about receiving booster vaccines. This study also found that most respondents (63.1 %) had a poor attitude regarding receiving booster vaccines. Most of the respondents (73.9 %) had good access to information about booster vaccine acceptance and some respondents (45.9 %) considered the role of health workers to be good about booster vaccine acceptance.

Table 2

Distribution of Respondents Based on Research Variables

Independent Variable	Total n = 333	Percentage (%)
Knowledge		
Good	83	24.9
Poor	250	75.1
Attitude		
Good	123	36.9
Poor	210	63.1
Access to Information		
Good	246	73.9
Poor	87	26.1
Family Support		
Good	64	19.2
Poor	269	80.8
Role of Health Workers		
Good	153	45.9
Poor	180	54.1

Table 3 indicates that access to information and the role of health workers are significantly related to booster vaccine acceptance. While for gender, education, employment status, knowledge, attitudes, and family support variables, there is no significant relationship with booster vaccine acceptance.

Access to information is significantly related to booster vaccine acceptance with a p-value of 0.013. Most respondents (62.4 %) had good access to information, but they did not receive booster vaccines. In addition to access to information, the role of health workers is also significantly related to booster vaccine acceptance with a p-value of 0.003. Most of the respondents (49.0 %) considered the health workers had a good role and they received booster vaccines. In addition, most women (62.7 %) chose not to receive booster vaccines, while most respondents (41.3 %) with less family support received booster vaccines.

Table 3

Relationship between Independent Variables and Dependent Variables

Independent Variable	COVID-19 Vaccines Acceptance				Total		p-value
	Succeed		Not Succeed				
	n	%	n	%	n	%	
Gender							
Male	71	42.5	96	57.5	167	100	0.395
Female	62	37.3	104	62.7	166	100	
Level of Education							
No study/primary education	46	38.3	74	61.7	120	100	
Secondary education	43	41.7	60	58.3	103	100	0.883
Higher education	22	43.1	29	56.9	51	100	
Undergraduate/ Bachelor/Master	22	37.3	37	62.7	59	100	
Occupation							
Farner	42	45.7	50	54.3	92	100	
Civil Servant	12	37.5	20	62.5	32	100	
Employed in the private sector	27	38.6	43	61.4	70	100	0.086
Student	19	55.9	15	44.1	34	100	
Housewife	33	31.4	72	68.6	105	100	
Knowledge							
Good	38	45.8	45	54.2	83	100	0.261
Poor	95	38.0	155	62.0	250	100	
Attitude							
Good	54	43.9	69	56.1	123	100	0.311
Poor	79	37.6	131	62.4	210	100	
Action							
Good	21	32.8	43	67.2	64	100	0.249
Poor	112	41.6	157	58.4	269	100	
Access to Information							
Good	88	35.8	158	62.4	246	100	0.013
Poor	45	51.7	42	48.3	87	100	
Family Support							
Good	22	34.4	42	65.6	64	100	0.385
Poor	111	41.3	158	58.7	269	100	
Role of Health Worker							
Good	75	49.0	78	51.0	153	100	0.003
Poor	58	32.2	122	67.8	180	100	

Table 4 shows that access to information and the role of health workers are most related to booster vaccine acceptance, while work and knowledge are not significantly related to booster vaccine acceptance.

This study found that access to information has a value of p=0.004 with an OR value of 2.129 greater than 1 which is a risk factor and significant because the lower value is 1.272 and the upper is 3.563 which does not contain a value of 1. This can be explained since respondents who can access information have 2,129 times the risk of not receiving the COVID-19 vaccine. The health worker role variable has a value of p = 0.001 with an OR value of 0.444 where less than 1 is a protective factor and is significant because the lower value is 0.278 and the upper is 0.707 which does not contain a value of 1. This means that respondents who do not feel the role of health workers have 0.444 times the risk of not receiving the COVID-19 vaccine.

Table 4

Results of Multivariate Analysis of Behavioral Determinants with Acceptance of COVID-19 Vaccination

Variables	B	Sig.	Exp (B)	95% CI Lower	Upper
Occupation	-0.117	0.121	0.889	0.767	1.031
Knowledge	-0.034	0.902	0.966	0.560	1.668
Access to Information	0.756	0.004	2.129	1.272	3.563
Role of Health Worker	-0.813	0.001	0.444	0.278	0.707

DISCUSSION

This study found that the variables of access to information and the role of health workers were related to COVID-19 vaccination acceptance in Citta District. In line with this study, a study on acceptance of the COVID-19 vaccine conducted in Saudi Arabia shows that health workers and the mass media have been identified as important sources of health information for the general public in the acceptance of the COVID-19 vaccine (11).

A study conducted in India regarding acceptance and concerns about the COVID-19 vaccine showed that around 42 % reported having received knowledge about vaccination through print media and 55 % through social media (12). This is in line with this study where it is known that access to information is related to the COVID-19 vaccination acceptance in Citta District Soppeng Regency in which 62.4 % of respondents with good access to information did not receive booster vaccines due to the large amount of information circulating about the adverse effects of vaccines and the community's inability to filter the information obtained. In concordance with this, a study conducted on acceptance and attitudes toward COVID-19 vaccines: A cross-sectional study from Jordan, shows that mistrust of any source of information about COVID-19 is 0.271 greater (13).

The local government according to district policy conducts mobile vaccinations aimed at those who have limited access to the nearest health service to carry out vaccinations accompanied by the Indonesian Army and Police. This was carried out as an effort to deal with problems related to access to information for booster vaccine acceptance and as an effort to accelerate the handling of COVID-19 in Citta District as well as reaching a wider range of residents who have limited access to health services.

The media is a party that should provide a valid source in educating the public about the COVID-19 vaccination because misinformation that spreads through various media channels can have a major impact on acceptance of the COVID-19 vaccine. In addition, sources of misinformation and conspiratorial beliefs spread through various media channels can also reduce the acceptance of the COVID-19 vaccine.

The role of health workers in driving factors is to encourage someone to act. Based on this study, it is known that the role of health workers has a relationship with COVID-19 vaccination acceptance in Citta District. These results are in line with a study conducted by the Ministry of Health, which found that around 79 % of respondents trusted more on health workers and medical workers 57 % seeking information about everything related to vaccinations. About 54 % of the most trusted sources of information about the COVID-19 vaccine are healthcare providers and health workers (13). Therefore, they can also maximize the role of health workers in conveying information about the COVID-19 vaccination.

These findings are against the results found in a previous study conducted by Rawung et al., who found that the role of health workers has no relationship with acceptance of the COVID-19 vaccination because the role of health workers can be replaced by social media which currently greatly influences a person's actions (14). However, in a study conducted by

Motta et al. (15), doctors and other health workers were identified as potential communicators in conveying messages that emphasized the medical and social benefits of the COVID-19 vaccine that could be disseminated effectively. Therefore, health workers must be careful in encouraging public confidence in the COVID-19 vaccination and minimizing misinformation, because refusal of vaccines can strengthen an outbreak (16).

Based on further analysis, the study found that access to information is a risk factor that influences booster vaccine acceptance, and the role of health workers is protective of booster vaccine acceptance in Citta District, Soppeng Regency. In line with this, government programs should aim at developing effective COVID-19 vaccination strategies, including tailor-made communication approaches, to ensure that all people in all locations have access to accurate information about vaccine safety and effectiveness.

Soppeng District government program such as door-to-door vaccination needs to be carried out, apart from involving health workers as vaccination officers. The involvement of health workers as a means of information can also be fulfilled, considering the level of public trust in the role of health workers is quite good.

This is in line with research conducted by UNICEF where the community makes health workers or medical staff a determinant in making decisions to vaccinate against COVID-19, followed by the role of family members in influencing vaccine acceptance (17). Nuzhath et al. found that misinformation was the main factor influencing people's acceptance of vaccinations. There were 32.47 % of respondents who were not willing to receive vaccinations due to misinformation obtained through the mass media (18). With these results of the study, it is expected that future government programs will target how to provide access to accurate and reliable information to the public through the utilization of existing health human resources.

In addition to supporting the desired acceleration, the factors utilization such as human resources by involving vaccinators from primary level health facilities to hospitals, availability of vaccines, distribution, and ease of access to vaccinations as well as assistance from related parties such as the Indonesian Army and Police should be carried out.

CONCLUSIONS AND RECOMMENDATIONS

Access to information and the role of health workers are the variables most related to the COVID-19 vaccination acceptance in Citta District, Soppeng Regency. Access to information in research is a risk factor and the role of officers is protective.

This is closely related to misinformation circulating in the community obtained from unreliable sources. It is important the role of health workers to provide education and explanations of information regarding news related to the COVID-19 vaccine circulating in the community and to collaborate with the government to provide accurate information media so that it can be accessed by the community. Thus, there are no errors in receiving information in the community, and this can help accelerate the handling of COVID-19 in Citta District, Soppeng Regency

Acknowledgement

The authors thank the Department of Epidemiology, Faculty of Public Health, Hasanuddin University, and the Soppeng Regency Government and Citta District Government for providing the opportunity and permission to conduct research, especially for the people of Citta District.

REFERENCES

1. World Health Organization. COVID-19 Response Fund WHO Coronavirus (COVID-19) Dashboard. 2021. Available from: https://covid19.who.int/table
2. Ministry of Health, Directorate General of Disease Prevention and Control, Directorate of Surveillance and Health Quarantine. Emerging Infections: Latest Official Information Media on Emerging Infectious Diseases. Jakarta; 2021. Available from: https://infeksiemerging.kemkes.go.id/dashboard/COVID-19

3. Dinar RE. COVID-19 Vaccine the Mandatory Book You Need to Know. In: Prabawati TA, editor. Yogyakarta: Rapha Publishing; 2021.
4. Palutturi S, Syam A, Arifin MA, Asnawi A . COVID-19 Indonesia Needs Us. Yogyakarta: Learning Library; 2020.
5. Ministry of Health. National COVID-19 vaccination. 2021. Available from: https://vaksin.kemkes.go.id/#/vaccines
6. Indonesian Ministry of Health. Current Situation of Coronavirus Disease (COVID-19) Development April 23, 2021. Emerging Infections. 2021. Available from: https://covid19.kemkes.go.id/situasi-infeksi-emerging/situasi-terkini-perkembangan-coronavirus-disease-COVID-19-23-april-2021
7. Government of Soppeng Regency. Achievement of COVID-19 Vaccination in Soppeng Regency on March 30, 2022. Soppeng; 2022.
8. Green LW, Kreuter M, Deeds SG, Partridge KB. Health education planning: A diagnostic approach. In: Health education planning: A diagnostic approach. 1980.p.306.
9. Ichsan DS, Hafid F, Ramadhan K, Taqwin T. Determinants of Community Willingness to receive COVID-19 Vaccination in Central Sulawesi. Poltekita J Health Science. 2021;15(1):1-11.
10. Lasmita Y, Misnaniarti M, Idris H. Analysis of Acceptance of COVID-19 Vaccination among the Community. J Kesmas (Public Health) Khatulistiwa. 2021;8(4):195.
11. Qattan AMN, Alshareef N, Alsharqi O, Al Rahahleh N, Chirwa GC, Al-Hanawi MK. Acceptability of a COVID-19 Vaccine Among Healthcare Workers in the Kingdom of Saudi Arabia. Front Med. 2021;8:1-12.
12. Anil A, Sharafudeen S, Krishna A, Rajendran R, James J, Kuruvilla S, et al. Acceptance and concerns regarding COVID-19 vaccine in Kerala, India. Public Heal Toxicol. 2021;1(1):1-6.
13. El-Elimat T, AbuAlSamen MM, Almomani BA, Al-Sawalha NA, Alali FQ. Acceptance and attitudes toward COVID-19 vaccines: A cross-sectional study from Jordan. PLoS One. 2021;16(April 4):1-15.
14. Rawung GM, Kaunang WPJ, Mantjoro EM. The Relationship of Knowledge, Family Support, and the Role of Health Workers with the Acceptance of COVID-19 Vaccination by The Community in the Paniki Bawah District. Prepotif. J Public Health. 2023;7(1):727-740.
15. Encouraging COVID-19 Vaccine Uptake Through Effective Health Communication. Front Polit Sci. 2021;3:1-12.
16. Malik AA, McFadden SAM, Elharake J, Omer SB. Determinants of COVID-19 vaccine acceptance in the US. E Clin Med. 2020;26:100495.
17. Pane M, Windyaningsih C. Puskesmas and Health Offices in Controlling the COVID-19 Pandemic Ministry of Health of the Republic of Indonesia Jakarta 2020. 2020.
18. Nuzhath T, Tasnim S, Sanjwal RK, Trisha NF, Rahman M, Mahmud SMF, et al. COVID-19 vaccination hesitancy, misinformation and conspiracy theories on social media: A content analysis of Twitter data. 2020.