



## How The Effect of Education After Level on COVID-19 Vaccination Status in the Community?

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**Abstract:**

The rapid global spread of COVID-19 requires practical prevention efforts, including vaccination. Public knowledge plays a crucial role in preventing transmission, and one factor influencing knowledge is education level. This study examines the relationship between educational attainment and COVID-19 vaccination status in Medan Tuntungan District. Using a cross-sectional design, the research involved 100 respondents from 68,000 individuals aged 18 and above. Data were collected through questionnaires and analyzed using univariate and bivariate methods. The results show no significant correlation between education level and COVID-19 vaccination status ( $p\text{-value} = 0.096$ ). Several factors contribute to this, including widespread access to information through mass media and public campaigns and knowledge gained outside formal education. In conclusion, education level does not impact the COVID-19 vaccination status of the community in Medan Tuntungan District. The implication

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of these findings is the importance of a broader and more equitable communication strategy in vaccination campaigns, focusing on groups with high levels of education and covering groups with lower levels of education through easily accessible media.

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### Introduction

The COVID-19 crisis is a worldwide epidemic initiated by the SARS-CoV-2 pathogen, which was initially detected in Wuhan, Hubei Province, China, at the end of 2019. This pandemic posed a significant threat to public health and garnered international attention. On January 30, 2020, the World Health Organization (WHO) announced COVID-19 as an international public health crisis (Yanti et al., 2020; Jee, 2020). This virus leads to a respiratory condition known as Coronavirus Disease 2019, commonly abbreviated as COVID-19. The disease can result in acute respiratory symptoms, including a high fever above 38°C, cough, and shortness of breath, which may also be accompanied by fatigue, muscle aches, and diarrhea (Mehta et al., 2021; Hadian & Masria, 2022).

COVID-19 is spreading rapidly and globally, with the first cases identified in multiple countries quickly. The spread of COVID-19 escalated quickly through the end of 2020. As of October 2020, over 200 nations were impacted by the pandemic, each exhibiting different mortality statistics. The first confirmed COVID-19 case in Indonesia was reported in March 2020 in Depok City, West Java. Subsequently, the virus spread swiftly, leading to over 1,500 cases and 139 deaths within just one month. As March 2021 came to a close, the total number of confirmed COVID-19 infections in Indonesia exceeded 1.3 million, with fatalities exceeding 40,000. This positioned Indonesia among the Southeast Asian nations with the most reported COVID-19 cases. In North Sumatra, data recorded at the North Sumatra Government Health Office until August 31, 2020, GTPP COVID-19 North Sumatra recapitulated data on people exposed to COVID-19 as many as 6,827 people, and the total of deaths reached 315 people (Sanyaolu et al., 2021; Khairani & Hutaauruk, 2022). The pandemic of COVID-19 is considered dangerous because of the high number of cases and high mortality rate (Aeni, 2021; Liu et al., 2021).

Alongside its effects on healthcare, the COVID-19 pandemic has profoundly influenced the social and economic landscape throughout every area of Indonesia. Lockdowns, travel restrictions, and social isolation have affected many people's daily lives, economy, and mental well-being. Social restrictions and lockdown measures can restrict people from participating in economic pursuits, hindering the exchange of goods and services. Extended enforcement of these protocols has resulted in a downturn in economic development in areas impacted by the COVID-19 outbreak (McKibbin & Fernando, 2020; Chaplyuk et al., 2021). A decrease in economic growth will subsequently lead to other economic consequences, including an increase in the jobless rate (Coibion et al., 2020; Chong et al., 2021). The financial consequences brought on by the COVID-19 outbreak can then result in repercussions in additional sectors, such as social aspects (Aeni, 2021; Aduhene & Osei-Assibey, 2021). Hence, it is essential to halt the COVID-19 pandemic to recover socio-economic conditions.

One of the efforts that can be made to stop the spread of COVID-19 and restore socio-economic conditions is to carry out COVID-19 vaccination. COVID-19 vaccination helps maintain an individual's immune system by quickly recognizing and combating infection-causing antigens. Additionally, the vaccination aims to encourage the establishment of community immunity, which is anticipated to safeguard

individuals who cannot get vaccinated, such as children, pregnant women, individuals with autoimmune disorders, and those with compromised immune systems. Herd immunity can be achieved if vaccination implementation is high and evenly distributed throughout the region. From an economic standpoint, preventive measures through vaccination are regarded as significantly more cost-effective than treatment effort (Indriyanti, 2021; Juneau et al., 2022).

Comprehensive knowledge from all sectors, including the community, is essential to preventing the spread of COVID-19 (Purnamasari & Raharyani, 2020). According to (Notoatmodjo, 2014), knowledge can be influenced by many factors, including educational attainment. The higher an individual's level of education, the greater their knowledge (Damayanti & Sofyan, 2022). According to Safari et al. (2023), the greater an individual's educational attainment, the better their behavior toward preventing COVID-19.

COVID-19 vaccination is crucial in the global effort to control the pandemic. A successful vaccination program depends not only on the availability of vaccines but also on the level of community acceptance. Knowledge, attitudes, and access to information greatly influence a person's decision to get vaccinated. Education is often considered a factor that plays a role in increasing public awareness of the importance of vaccination. However, further research is needed to understand whether education significantly impacts vaccination participation, especially at the community level, such as in Medan Tuntungan District.

This study is important because the results can provide a clearer picture of the factors influencing people's decision to accept vaccines. If education is not the main factor, health communication strategies must focus on other aspects, such as access to information through mass media or broader health campaigns. These findings can help the government and policymakers design a more effective and inclusive approach to increasing vaccination coverage so that they can more optimally break the chain of COVID-19 transmission.

Based on a survey by researchers, many people in Medan Tuntungan District still refuse COVID-19 vaccination. Considering this, it is important to understand the community's reception of the COVID-19 vaccine and how educational attainment influences the COVID-19 vaccination status in Medan Tuntungan District. This study examines the impact of education level on COVID-19 vaccination status in Medan Tuntungan District.

## Research Method

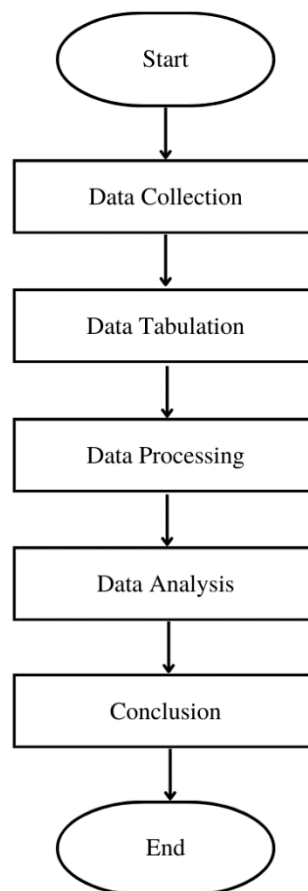
This study was conducted in Medan Tuntungan District from March to December 2021. The population included 68,000 residents of Medan Tuntungan District, all aged 18 and above. The number of participants was 100. The number of samples was determined using the formula for determining the sample size (Notoatmodjo, 2010):

$$n = \frac{N}{1 + N(d)^2}$$

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Where  $N$  is the population size,  $n$  is the sample size, and  $d$  is the desired level of confidence/determination (0,1).

This study employs a quantitative research approach with a cross-sectional design. A cross-sectional study investigates the relationship between exposure or independent risk factors and their resulting outcomes or effects (dependent variables), with data on both risk factors and outcomes collected simultaneously using a point-in-time approach, where all independent and dependent variables are observed at the same time ([Masturoh & Anggita, 2018](#)). In this study, observations or measurements were made simultaneously or simultaneously to determine how the level of education influences the vaccination status for COVID-19 within the community in Medan Tuntungan District. The research flowchart can be seen in Figure 1.



**Figure 1. Research Flowchart**

The data collection technique used is by distributing questionnaires online to respondents. The questionnaire distributed in this research is a closed question whose answer choices have been determined by the variables to be studied. The study was carried out utilizing a framework that included independent variables and dependent variables. The independent variable includes education level, while the dependent variable includes COVID-19 vaccination status.

The collected data is then tabulated. Tabulating data compiles and organizes data that can be easily summed, arranged, and displayed in tabular or graphic form ([Rizqah et al., 2021](#)). After tabulating the data, it is processed by a computerized system for later analysis. The entered data is further interpreted using univariate and bivariate

analysis. Univariate analysis aims to gain a basic understanding of one variable, such as data distribution, central tendency, and variation in one variable. In contrast, bivariate analysis aims to identify and understand relationships, correlations, or differences between two or more variables. This research conducted a single-variable analysis to assess how educational attainment aligns with COVID-19 vaccination status. Moreover, a chi-square test was conducted for bivariate analysis to assess how the level of education affects COVID-19 vaccination outcomes.

## Results and Discussion

### Socio-Demographic Characteristics of the Respondents

The characteristics of respondents in Medan Tuntungan District are shown in Table 1. It is observed that most of the respondents were female (68.3%), aged  $\leq 45$  years (63.46%), with a tertiary education level (61.5%), married marital status (60.6%), self-employed (32.7%), total monthly expenditure of Rp. 2,128,001 - Rp. 4,800,000 (42.3%), and the health insurance owned by respondents was BPJS (66.3%).

**Table 1. Distribution of Characteristics Based on Respondents' Sociodemographics**

Variable	Category	f	%
Gender	Male	33	31.7
	Female	71	68.3
Total		104	100
Age	Aqq	66	63.46
	>45 Years	38	36.54
Total		104	100
Education	Not Completed in Elementary School	1	1
	Finished Elementary School	10	9.6
	Finished Junior High School	5	4.8
	Finished High School	16	15.4
	Completed Diploma	8	7.7
	College	64	61.5
Total		104	100
Marital Status	Married	63	60.6
	Not Married Yet	33	31.7
	Widowed	8	7.7
Total		104	100
Job	Doesn't Work	20	19.2
	Laborer	11	10.6
	Student	13	12.5
	Self-Employed	34	32.7
	Civil Servants/Military/Police	26	25
Total		104	100
Monthly Expenses	< Rp. 1,416,000	17	16.3
	Rp. 1,416,000 - Rp. 2,128,000	29	27.9
	Rp. 2,128,001 - Rp. 4,800,000	44	42.3
	Rp. 4,800,001 - Rp. 24,000,000	14	13.5
Total		104	100
Health Insurance	BPJS	69	66.3
	Private Insurance	10	9.6
	BPJS and Private Insurance	10	9.6

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	There isn't any	15	14.4
Total		104	100

### Distribution of Respondents' Answers

The outcomes of the participant responses to the survey questions are presented in Tables 2 through 4.

**Table 2. Distribution of Respondents' Answers Related to COVID-19 Vaccination and Infection**

Question	Answer	f	%
Current Vaccination Status?	Already had the first vaccine	6	5.8
	Have been fully vaccinated	55	52.9
	Not vaccinated at all	43	41.3
Total		104	100
Participation in the vaccination program?	There are government programs	36	34.6
	Enroll	46	44.2
	Following mass vaccination	12	11.5
	Don't want to be vaccinated	10	9.6
Total		104	100
Have you ever been infected with COVID-19?	Don't know	4	3.8
	Yes, it has and it's confirmed	27	26.0
	It seems to have happened, but not confirmed	3	2.9
	Never	70	67.3
Total		104	100
Has anyone in your household ever been infected with COVID-19?	Don't know	1	1
	Yes, it has and it's confirmed	29	27.9
	Never	72	69.2
	There are no people in the house	2	1.9
Total		104	100
What is your confidence in the current COVID-19 vaccine?	Not sure about safety	2	1.9
	Not sure it's effective	5	4.8
	Afraid of side effects	8	7.7
	Don't believe in vaccines	2	1.9
	Certain	87	83.7
Total		104	100

Table 2 shows that 52.9% of respondents were fully vaccinated, while 41.3% had not received any vaccination. Most respondents who participated in the vaccination program had enrolled themselves (44.2%), while 9.6% expressed a refusal to get vaccinated. As many as 26% of respondents have been confirmed with COVID-19, and 27.9% have been confirmed by people who live in the same house as respondents. Participants expressed strong assurance regarding the existing COVID-19 vaccine, with 83.7% expressing confidence. Meanwhile, 16.7% of respondents are unsure, afraid, or do not believe in the COVID-19 vaccine.

Public distrust of the COVID-19 vaccine is still widely found. [Milman et al. \(2021\)](#) conducted a survey and found that many global people still doubt vaccines. The survey found that skepticism towards vaccines had a relationship with the low trust of citizens in the government. If this applies to Indonesia, then it is probable that the

President's first vaccination the other day was not enough to "leverage" public trust. This is serious, considering vaccination is one of the measures taken during the COVID-19 pandemic ([Dewi, 2021](#)). People willing to be vaccinated must have confidence in the vaccine itself. Doubts about receiving vaccines arise due to the conviction surrounding a conspiracy related to COVID-19 vaccinations. Therefore, they are unwilling to get vaccinated ([Freeman et al., 2022](#); [Putri et al., 2021](#)).

**Table 3. Distribution of Respondents' Answers Regarding Knowledge of COVID-19**

COVID-19 Knowledge	0-20%		21-40%		41-60%		61-80%		81-100%	
	N	%	n	%	n	%	n	%	n	%
Your knowledge of COVID-19 transmission methods	0	0.0	12	11.54	12	11.54	39	37.5	41	39.42
Your knowledge of the symptoms of COVID-19	1	0.96	10	9.62	13	12.5	35	33.65	45	43.27
Your knowledge regarding health care for COVID-19 patients	0	0.0	11	10.58	13	12.5	37	35.58	43	41.35

According to Table 3, regarding knowledge of COVID-19, the majority of respondents (81-100%) demonstrated knowledge about COVID-19 transmission methods (39.42%), symptoms (43.27%), and healthcare for COVID-19 patients (41.25%). Education also plays a role in knowledge acquisition: the more advanced a person's education is, the more effortlessly they can obtain information, increasing their understanding. On the other hand, individuals with lower education levels may face challenges in developing the attitude needed to absorb new information and values ([Trisna & Musiana, 2022](#)). According to the research results, individuals with an advanced level of education account for 61.5%, so the majority of knowledge levels are in the range of 81-100%.

**Table 4. Distribution of Respondents' Answers Regarding Personal Risk of being Exposed to COVID-19**

Variable	Category	f	%
To what extent do you rate yourself at risk of contracting COVID-19 now compared to before the vaccination program?	It's easier to get infected	69	66.3
	Just the same	16	15.4
	More difficult to get infected	15	14.4
	It's impossible to get infected	1	1
	Don't know	3	2.9
Total		104	100
If you feel that you are more easily infected, it is because of what factors?	Have comorbid diseases	11	12.9
	Having a risky age	11	12.9
	Having people in the house who often do not practice health protocols	25	29.4
	Have coworkers/friends who often do not practice health protocols	30	35.3
	I often do not comply with health protocols	8	9.4
Total		85	100
To what extent are you worried about contracting COVID-19 now compared to before the vaccination program?	Worry more	6	5.8
	Just the same	26	25
	Worry less and less	63	60.6

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	Not worried at all	8	7.7
	Don't know	1	1
Total		104	100
	The number of deaths around you	4	13.3
	Often the victim is infected without realizing it	14	46.7
If you feel more worried about being infected, what factors is it because of?	Feeling like vaccines are not useful enough	1	3.3
	Feel the virus is getting more virulent	11	36.7
Total		30	100

Table 4 presents that most respondents evaluated their current risk of contracting COVID-19 compared to before the vaccination program was easier to contract (66.3%); respondents feel easier to contract because they have work colleagues/friends who often do not practice health protocols (35.3%), the extent to which respondents feel worried about contracting COVID-19 at this time, compared to before the vaccination program the majority of respondents answered less worried (60.6%), and out of 30 respondents feel more worried because victims are often infected without realizing it (46.7%). The vaccination program brings benefits, so people are less worried. This is because vaccines offer numerous benefits; in addition to protecting individuals from the virus, they also help reduce its transmission (Aldilawati & Hidayat, 2021; Rahayu et al., 2021).

### Bivariate Analysis Results

The media is crucial in delivering current information (Masluhiya AF et al., 2022). Sources of information during the spread of infectious diseases are vital for facilitating effective communication regarding public health risks. In an outbreak, individuals must access trustworthy information that supports them in taking health-protective actions (Vaughan & Tinker, 2009; Yıldırım et al., 2021). The COVID-19 pandemic can lead to uncertainty, prompting people to adjust their behaviors and attitudes towards it, altering how they consume news and the sources from which they receive it. With the advent of new technological innovations, particularly in electronic information channels, many individuals now prefer to use online platforms, like the web and social networks, for convenient retrieval of data (Jardine et al., 2015; Geçer et al., 2020). Table 5 presents the bivariate analysis used to evaluate the effect of information sources on COVID-19 concerning education level.

**Table 5. Relationship between Sources of Information Regarding COVID-19 and Education Level**

Variable		Education Level		<i>p</i>
		Low Education	Higher Education	
Source of Information Regarding COVID-19 from the Family	Seldom	1	0	0.023
	Sometimes	4	6	
	Often	11	49	
	Always	3	30	
Sources of Information Regarding COVID-19 from Social Media	Seldom	3	1	0.000
	Sometimes	8	9	

Source of Information Regarding COVID-19 from TV/Radio	Often	6	47	0.000
	Always	2	28	
	Seldom	3	0	
	Sometimes	9	11	
Sources of Information Regarding COVID-19 from the Web	Often	4	47	0.098
	Always	2	27	
	Seldom	3	20	
	Sometimes	2	15	
Source of Information Regarding COVID-19 from Health Officials	Often	1	11	0.002
	Always	0	9	
	Seldom	5	13	
	Sometimes	6	17	
	Often	1	38	
	Always	4	16	

Table 5 illustrates that most respondents who frequently received COVID-19-related information from their families recorded a p-value of 0.023, suggesting a notable correlation between the family as an information source and respondents' education levels. Respondents with lower education levels occasionally obtained COVID-19 information from social media. In contrast, those with higher education levels did so more frequently, as shown by a p-value of 0.000, confirming a correlation between social media as an information source and education level. Similarly, most respondents with lower education levels occasionally received information from TV/Radio, while those with higher education levels did so more often. With a p-value of 0.000, a noteworthy association is suggested. Conversely, most respondents rarely obtained COVID-19 information from web sources, with a p-value of 0.098, suggesting no meaningful relationship.

Additionally, respondents with lower education levels occasionally received information from health workers, while those with higher education levels did so frequently, as reflected by a p-value of 0.000, confirming an association between health workers as an information source and education level. Most respondents sourced COVID-19 information from family, social media, and TV/Radio. These results are aligned with the results of research by [Junias & Toy \(2021\)](#) which shows that respondents obtained more information about COVID-19 from the internet/social media and mass communication media such as radio, television, and newspapers.

Reports indicate that people from various financial and social backgrounds often gather information utilizing different media outlets. For instance, how individuals engage with the internet showcases significant variation according to their educational attainment. Research also emphasizes a strong link between education level and news consumption, indicating that individuals with advanced formal education are generally more inclined to regularly keep abreast of current news ([Poindexter & Mccombs, 2001](#)). [Geçer et al. \(2020\)](#) researched to examine differences in information sources based on education level. There were notable differences between group mean to TV ( $p < 0.01$ ) and family and friends ( $p < 0.01$ ). Tukey's post hoc test shows that high school graduates and under and university graduates watch more TV than postgraduate graduates. It also shows that university graduates gather greater insights from their relatives and acquaintances compared to those with a high

school education or less and individuals with postgraduate degrees. In addition, using the Welch's F test, it was found that there was a significant effect for all remaining information sources based on education level: informative meetings ( $p < 0.001$ ); newspapers ( $p < 0.001$ ); internet ( $p < 0.001$ ); social media ( $p < 0.001$ ). The findings from the Games-Howell post hoc analysis indicated that individuals with postgraduate degrees participated in more informational sessions than those with only high school education or lower and those who had completed university degrees.

Additionally, postgraduates read newspapers more frequently than high school graduates or below and university graduates. High school graduates access information from the internet less frequently than university and postgraduate graduates. They were also less engaged with social media than university graduates and postgraduates. At the same time, those holding university degrees engaged more frequently on social media than those with postgraduate qualifications.

The results also indicate that education level is linked to increased information-seeking through television, newspapers, the Internet, and informational meetings. These results align with previous studies, indicating that individuals with lower education levels may have limited knowledge or are less likely to access information through virtual platforms like the Internet ([Ramsey et al., 2009](#)). The study found significant differences in participants' information-seeking behaviors across various sources regarding education level. Individuals with lower education levels (such as high school graduates or below) primarily relied on traditional media like television. In contrast, those with higher education levels tended to obtain information from more modern sources, such as the Internet and informational meetings. These findings indicate that individuals with higher education are more adept at using digital media technologies and prefer online platforms for accessing information ([Geçer et al., 2020](#)).

Information about COVID-19 is acquired through information received, both through social media and other print and electronic media, and also depends heavily on individual interest in receiving information. Information-related factors influence knowledge, as the ease of accessing information can facilitate and accelerate an individual's acquisition of new knowledge. Information can be obtained from print media such as posters, leaflets, and brochures, and electronic media such as television, radio, and the Internet. Health education can also obtain information ([Mubarak, 2007](#); [Trisna & Musiana, 2022](#)). The information provided can help people to know earlier about COVID-19 and how to control it. Mass media can help the government disseminate information about COVID-19 faster, more accurately, and reliably. Therefore, information media is critical to assist the government in disseminating information related to COVID-19 ([Masluhiya AF et al., 2022](#)).

The findings of [Pascawati & Satoto's \(2020\)](#) study gathered extensive data regarding the views, understanding, and behaviors of Indonesians related to COVID-19. This study shows that Indonesian people know how to prevent COVID-19 transmission. Most individuals hold a favorable view of the government's efforts in managing the COVID-19 pandemic in Indonesia, and most individuals have implemented suitable strategies to hinder transmission and enhance their immune systems. Nevertheless, if widespread understanding, perspectives, and actions about the risks associated with COVID-19 are lacking, the threat of additional cases and swift

transmission will continue. Consequently, ongoing communication of information and instruction from health organizations and governmental bodies is critical for managing the spread of COVID-19. Furthermore, recognizing public segments through demographic factors is crucial to guarantee that information and education are accurately directed.

Table 6 examines the effect of educational attainment on COVID-19 vaccination outcomes. As shown in Table 6, at the low education level, the majority have not been vaccinated at all, while at the high education level, the majority have been fully vaccinated. The  $p$ -value of  $0.096 > 0.05$  shows that there is no correlation between educational attainment and present vaccination status. It can be concluded that education level does not impact COVID-19 vaccination status.

**Table 6. Relationship between Education Level and Current Vaccine Status**

Education Level	Current Vaccine Status			$p$
	Already Vaccinated First	Completely Vaccinated	Not Vaccinated at All	
Low	1	6	12	0.096
High	5	49	31	

Numerous studies have presented data on the relationship between educational attainment and vaccination status. The majority of these studies, including investigations carried out by Abebe et al. (2021), indicated that educational attainment significantly influences the willingness to receive vaccination ( $p$ -value  $< 0.001$ ). The research showed that individuals with at least a secondary education were threefold more inclined to receive the COVID-19 vaccine than those without formal schooling. Similarly, Karimah et al. (2022) found a significant association between the education level of pregnant women and their participation in COVID-19 vaccination ( $p$ -value = 0.000).

In contrast to other studies, the opposite result was obtained in this research. Namely, education level was not influenced by COVID-19 vaccination status. The research of Cengiz et al. (2022) found no favorable connection between the level of education and the rates of vaccination. Even though individuals who completed high school have received more education than those who finished primary school, the varying perceptions regarding vaccination show that simply having a longer educational background does not guarantee increased vaccination participation.

Several factors cause education levels to not influence participation in COVID-19 vaccination, including information that is easily accessible through mass media and campaigns and knowledge acquired beyond formal education (Karimah et al., 2022). This is aligned with research by Dewy (2019) and Nadhifah et al. (2021) which states that maternal education level is not related to MR vaccination. There is an absence of an association between education level and MR vaccination because vaccination is a government program that requires children to be vaccinated. In addition, mothers with low education can also get information about immunization from TV or the nearest health worker, thus causing the mother to be interested in participating in posyandu activities.

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Public awareness, education, and effective vaccination policies are important to increase vaccination rates in the community. One approach to enhancing understanding during the socialization of the COVID-19 vaccine is to deliver accurate explanations and clear information, enabling the target community to grasp the significance of the vaccine campaign and ultimately accelerating the vaccination process within the community (Malau et al., 2022). The implication is that it can play a role in educating the public about the need for vaccination and breaking the COVID-19 transmission cycle (Lawelai et al., 2022).

### Conclusion

Based on the findings of this study, the level of education does not impact the COVID-19 vaccination status of the community in Medan Tuntungan District. Several factors contribute to the lack of influence of education level on vaccination participation, including the easy accessibility of information through mass media and campaigns and knowledge not solely derived from formal education. Public education through COVID-19 vaccination socialization efforts is essential to enhance community awareness of vaccination, thereby helping to break the chain of COVID-19 transmission. Although the COVID-19 pandemic has subsided, vaccination education remains relevant, especially for booster vaccines for vulnerable groups. In addition, vaccination socialization can raise awareness of other infectious diseases and prepare the community for future pandemics. With ongoing education, the public's understanding of the importance of vaccination is maintained.

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