

## KNOWLEDGE, ATTITUDE, AND BEHAVIOR OF THE ELDERLY TOWARDS THE IMPLEMENTATION OF COVID-19 VACCINATION IN SOUTH NIAS, INDONESIA: ACROSS SECTIONAL STUDY

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### ABSTRACT

*Despite the susceptibility of the elderly to COVID-19, vaccination coverage in this age group is still far from Indonesia's national target. This research studied the implementation of the COVID-19 vaccine in Teluk Dalam, South Nias District, in 2021 and analyzed the relationship between knowledge, attitudes, and behaviour of the elderly towards implementing vaccination. It was a mixed-method study with an explanatory design. The population of this study included the elderly in Teluk Dalam, with a total of 33 people serving as research samples and three informants for qualitative data. Data were obtained by administering questionnaires and interviews, analyzed by the SPSS statistical tool with chi-square test at  $\alpha = 5\%$ , and compared with the collected qualitative data. The results showed that the elderly in Teluk Dalam's knowledge of implementing the COVID-19 vaccine was still low, with negative attitudes and behaviour. There was a significant relationship between knowledge, attitudes and behaviour of the elderly towards implementing COVID-19 vaccination in Teluk Dalam, South Nias District ( $p < 0.05$ ). It is recommended that the elderly attend counselling given by health workers so that they can increase their knowledge about the implementation of the COVID-19 vaccination and change their attitude and behaviour and want to take part in the COVID-19 vaccination and health workers to provide information about the implementation of the COVID-19 vaccine to the public, especially the elderly more specific.*

**Keywords:** Knowledge; Attitude; Behavior; Elderly; Covid-19 Vaccine

### 1. INTRODUCTION

COVID-19 is an infectious disease caused by SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus-2). It was the first detected Coronavirus disease in China in December 2019. The symptoms range from asymptomatic to severe pneumonia with acute respiratory failure. Since mid-March 2020, the COVID-19 pandemic has spread throughout the world and become the cause of the highest death rate in the world [1,2]. Globally, as of 14 June 2023, the total number of positive cases of COVID-19 was 767, 984, 989 while those who died were 6,943,390 and a total of 13,397,153,690 vaccine doses have been administered [3].

Indonesia is ranked 24th in the world with the most cases of exposure to COVID-19. On

September 3, 2021, a total of 4,116,890 million positive cases were recorded; 134,930 million died, and 3,5813,643 million were declared cured [4]. As the fourth most populous country in the world, Indonesia carries a high risk of transmission on a large scale [5], not only a large number of cases, but the death rate of COVID-19 in Indonesia was also very high. Based on the data from Johns Hopkins University, Indonesia was the first ranked with the highest case fatality rate (8% - 9%) [6].

The Indonesian government estimates that the total need for vaccines in Indonesia is 181.5 million people, where health workers and public services across 34 provinces (approximately 1.4 million people) are prioritized to receive the vaccines in the first phase. After that, the second phase of vaccination

targets public officers (17.4 million) and elderly (21.5 million), then the third stage is for vulnerable communities, namely people in areas with high risk of transmission (63.9 million), while the fourth stage is for other community (77.4 million) with a cluster approach according to vaccine availability [7]. As aforementioned, the Indonesian government has targeted that the vaccination coverage for the elderly is 21.5 million, yet the data on September 3, 2021, shows that the number of senior citizens who had received the vaccines in the first and second stages was only 9,183,661. This number indicates that the implementation must still be the expected target [8].

The elderly are individuals aged 60 years and older. In nearly five decades (1971-2020), the percentage of older adults in Indonesia has increased by about two-fold to 9.29% (approximately 26 million), where the percentage of female older adults is 1% higher than that of males (10.43% and 9.42% respectively). Of all the elderly population in Indonesia, the youngest-old group (60-69 years) far dominates the population, with the percentage reaching 64.29%, followed by middle-old (70 - 79 years) and old elderly (>80 years old) with respective percentages of 27.23% and 8.49%. As of the year this study is carried out, there are six provinces of which the percentage of the older adult population has reached 10% or more, namely DI Yogyakarta (14.71%), Central Java (13.81%), East Java (13.38%), Bali (15.58%), North Sulawesi (11.51%), and West Sumatra (10.07%). The percentage of the elderly population in the province of North Sumatra is still below 10%, i.e. 8.29% of the total population [9].

Deterioration of organ function resulted from aging process in elderly makes this age group vulnerable to various health issues. The most common diseases in the elderly are non-communicable diseases such as heart disease, diabetes, stroke, rheumatism and injuries. The occurrence of comorbidities in older adults population explains why this age group is also vulnerable to COVID-19 disease caused by the SARS-Cov-2 virus [10].

Based on the data from Teluk Dalam Health Agency, the total number of elderly people in Teluk Dalam in 2020 was 2006 people. However, the coverage of vaccine administration to the older adult population for the first dose was only 3.49% and 1.5% for the second dose. Furthermore, it was also reported that the participation of the elderly in urban areas is higher than those in rural areas. It is apparent that the low participation of the elderly in the village is due to the lack of direct socialization. Additionally, other constraints such as ineligible status on the initial screening, limited vaccine availability, and length of time waiting in line during the administration prevented the senior people from receiving the vaccines.

Lawrence Green's theory suggests that the health condition of individuals or communities is influenced by two main factors, namely behavioural and non-behaviour factors. Behavioural factors are influenced by three factors, including predisposing factors (the internal factors, such as knowledge, attitudes, values, beliefs, and perceptions), enabling factors (related to the physical environment and access to health service facilities), and reinforcing factors (support from outside parties including family behaviour, health workers, relatives or community leaders) [11]. Moreover, as advocated by Green's behavioural concept, one's knowledge and attitude are determinants of an individual's health condition. Despite the vital role of formal education in gaining knowledge, there are other ways to receive information, as it is now ubiquitous. Going deeper into individuals' knowledge may contain two positive and negative aspects. These two aspects will ultimately determine their attitude toward particular subjects. The more positive information one receives, the more one's attitude will grow [11].

A study conducted by the Ministry of Health of Indonesia found that the acceptance rate of Indonesian citizens toward the COVID-19 vaccines was still low because they were concerned about the vaccine's safety and effectiveness. Many respondents expressed distrust of vaccines and questioned their halal

status. Besides, doubts also arose from those who were afraid of needles and who experienced the side effects after being vaccinated [12]. The misleading information then spread in the community, growing negative attitudes of people to delay taking the COVID-19 vaccines despite its importance to stop the rapid transmission of the virus.

Teluk Dalam, located at the southern tip of Nias Island and directly adjacent to Amandraya and Lahusa Districts, is the capital of South Nias District, with an area of 42.04 km<sup>2</sup>. As of 4 August 2021, there were 446 people confirmed for COVID-19; 252 were still in isolation, and six people died. Regarding COVID-19 vaccination, 390 older adults have received the first dose. However, only 72 people were reported to have received the second dose, which is still far below the target set by the government, that is 38,090. These numbers indicate that the implementation of COVID-19 to the elderly in Teluk Dalam, South Nias District, is only 20% [4]. That was the first study to implement the COVID-19 vaccine in Nias, a rural and remote island in Indonesia. Based on this background, this study analyzes the relationship between knowledge, attitudes, and behaviour of the elderly concerning the implementation of COVID-19 vaccination. It evaluates the implementation of vaccination in Teluk Dalam District, South Nias District, in 2021.

This study was a mixed-method study with an explanatory research design. The study carried out quantitative methods to collect measurable quantitative data by administering a questionnaire. Then, in the second stage, the research employed qualitative methods to prove, deepen, expand, weaken and abort the quantitative data obtained in the first stage. Furthermore, the study was conducted in Teluk Dalam, South Nias District, from March to August 2021. The data was collected from 10th to 12th May 2021.

The population in this study were 206 elderly citizens in Teluk Dalam, South Nias District. A total of 33 older adults were selected as research samples after performing sample size calculations using the Lameshow formula [13].

Sample selection was carried out purposively to fit the research objective. Respondents who met the inclusion criteria, including the elderly aged 60 years or older, could understand and respond to the researchers and were not disabled or handicapped. If the respondents fully understood the questions but had minor issues responding to the researchers, they were accompanied by one of the family members.

The data collection techniques used in quantitative and qualitative research methods were questionnaires with interview techniques. A set of closed questionnaires were administered to the respondents, where respondents chose one out of multiple alternatives. The question items in the questionnaire were to evaluate respondents' knowledge, attitudes and behaviour concerning the implementation of the COVID-19 vaccine in the elderly. The questionnaire was adopted from research that conducted a community survey in Bangladesh [14], and we translated it into the Indonesian language. Meanwhile, the qualitative data was collected by performing interview sessions with three informants, comprised of 1 health worker and two older adults. The elderly informants were selected randomly from those who had responded to the questionnaire earlier. A structured interview consisting of a list of questions the researcher had prepared was administered to collect qualitative data to support the quantitative data. All informants received the same questions in uniform order [15].

## 2. RESEARCH METHODS

The scoring system was different for each variable. The questions in variable knowledge were scored according to respondents' correct answers. Each correct answer was scored 1, whereas the wrong answer was scored 0. After that, the correct answers were accumulated and categorized according to the following classification: high (if respondents' correct answers range from 76-100% or equal to 12-15 correct answers), moderate (if respondents' correct answers range from 60-75% or equal to 9-11 correct answers), low (if respondents'

correct answers less than 60% or equals to <9 correct answers).

Regarding attitude, respondents' responses were scored using a Likert Scale ranging from 1 (strongly disagree) to 4 (strongly agree). The total score was then categorized into negative or positive according to the following criteria: positive if the score was 39-60 and negative if the score was 15-38. Moreover, the variable behaviour was scored by responses of yes or no. The response Yes was scored 1, while No was scored 0. Similar to the other variables, the total score was then categorized into two, namely: Good if the score was 6-10 and Poor if the score was 0-5.

After that, quantitative and qualitative data collections were analyzed using different methods. Two statistical analyses were performed to analyze the quantitative data. Univariate analysis was used to describe knowledge, attitude, and behaviour variables. Furthermore, bivariate analysis using a Chi-Square statistical test was used to see any significant relationship between the variables. Meanwhile, the qualitative data from the interview sessions with three informants were analyzed inductively. Specific and concrete facts from informants' responses were identified, synthesized, and generalized to analyze the similarities to obtain general characteristics [16]. Then, qualitative results supported the quantitative results to help researchers reach conclusions [17].

### 3. RESULTS

The results of this study's quantitative and qualitative data were presented in different sections. Table 1 illustrates the characteristics of respondents in the present study. As shown in the table, the respondents who participated were primarily in the age range of 60-70 years old (n= 15 or 75.4%) and were dominated by respondents with low levels of education (n= 24 respondents; 72.7%). Regarding sex, male and female respondents were nearly similar, though male respondents still outnumbered females (17 and 16 for males and females, respectively). Furthermore, the data reveals that respondents

were from different occupational backgrounds, with merchants being the occupation with the highest percentage (n=11; 33.3%). Regarding the source of information on COVID-19 vaccination, most respondents reported that they received the information from family (n= 20; 60.6%).

Table 1. Respondents' characteristics

Characteristics	n	%
<b>Age</b>		
60-65 years	12	36.4
65-70 years	13	39.4
> 70 years	8	24.2
Total	33	100.0
<b>Sex</b>		
Male	17	51.5
Female	16	48.5
Total	33	100.0
<b>Education</b>		
High	9	27.3
Low	24	72.7
Total	33	100.0
<b>Occupation</b>		
Government Office	3	9.1
Retire		
Merchant	11	33.3
Entrepreneur	8	24.2
Farmer	9	27.3
Housewife	2	6.1
Total	33	100.0
<b>Source of Information</b>		
Health Worker	6	18.2
Family	20	60.6
Mass Media	5	15.2
Community	2	6.1
Total	33	100.0

Table 2 shows an overview of respondents' knowledge, attitudes, and behaviours concerning the implementation of COVID-19 vaccination. It shows that only a small number of respondents, i.e. nine people (27.3%), had a high level of knowledge on COVID-19 vaccination. In contrast, nearly half of the respondents (48.5%) showed a low level of knowledge. In terms of attitude, the data shows that the percentage gap between positive and negative attitudes was less than 10%. It indicates that the proportions of

respondents with positive and negative attitudes were nearly similar. However, the number of respondents with negative attitudes was three people more than their counterparts (15 and 18 respondents for positive and negative, respectively). What is surprising from this data is that despite the high proportion of respondents with low levels of knowledge and negative attitudes, it is found that over half of the respondents showed good behaviour concerning the implementation of COVID-19 vaccination (n= 20; 60%).

Table 2. Respondents' knowledge, attitudes and behaviour concerning the implementation of the COVID-19 vaccination

Variables	n	%
<b>Knowledge</b>		
High	9	27.3
Moderate	8	24.2
Low	16	48.5
Total	33	100.0
<b>Attitude</b>		
Positive	15	45.5
Negative	18	54.5
Total	33	100.0
<b>Behavior</b>		
Good	20	60.6
Poor	13	39.4
Total	33	100.0

The bivariate analysis results between the knowledge and behaviour of respondents to COVID-19 vaccination are shown in Table 3, showing that respondents' level of knowledge was followed by their behaviour. Moreover, the result also obtained a p-value of 0.004 (p<0.05), indicating a significant relationship between knowledge and behaviour.

Table 3. The relationship between the knowledge and behaviour of respondents concerning the implementation of the COVID-19 vaccination

Variable	Behavior						p-value
	Positive		Negative		Total		
	n	%	n	%	n	%	
<b>Knowledge</b>							
High	8	88.9	1	11.1	9	100	

Moderate	7	87.5	1	12.5	8	100	0.004
Low	5	31.2	11	68.8	16	100	

Table 4 shows that respondents with a positive attitude to COVID-19 vaccination also showed good behaviour on the program, shown by the high percentage (86.7%). In contrast, the data illustrates that respondents with negative attitudes also tended to show poor behaviour concerning the program, with a percentage of 61.1%. This relationship is confirmed with the obtained p-value = 0.015 (p<0, 05), indicating a statistically significant relationship between attitude and behaviour in the study.

Table 4. The relationship between attitude and behavior of respondents regarding the implementation of the COVID-19 vaccination

Variable	Behavior						p-value
	Positive		Negative		Total		
	n	%	n	%	n	%	
<b>Attitude</b>							
Positive	13	86.7	2	13.3	15	100	0.015
Negative	7	38.9	11	61.1	18	100	

The results from the interview sessions with the elderly informants revealed that all informants in the present study had not received a complete dose of COVID-19 vaccines. The first informant reported to have only received the first dose. The second informant even reported that he had not received the COVID-19 vaccines. The second informant asserted a strong statement of refusing to accept the vaccine: "Not yet, I do not want vaccines." That indicates that both informants consciously decided their disinterest in COVID-19 vaccines.

The two informants gave similar responses concerning the necessity of receiving the COVID-19 vaccine. The first informant reported that he was immunized because one of his family members asked when the health workers visited their house for the vaccination program. What makes it interesting is his statement stating that he was not sure of the significance of the vaccines because he had minimal contact and interaction with other people and only stayed at home. The second informant also supported the first informant's report. According to him, his

decision was not to be vaccinated because the rumour influenced him; he heard from the surroundings that many people fell sick or even died after they received the vaccines. Adding to this, the second informant worried that he might bring a burden to the family if the side effects of the vaccine made him sick or die. These reports infer that the older adult informants in this study did not have reliable knowledge of the COVID-19 vaccine as they received the information from unreliable sources.

Moreover, informants were asked additional questions regarding their knowledge and attitude on COVID-19 vaccines. It was found that both informants agreed that there is still a possibility of being infected again despite the vaccination. The first informant reported that he had been informed by the health workers that one could be sick from COVID-19 again even though they had received the vaccines as it is not to cure but to prevent people from suffering from fatal health issues caused by the virus.

The following is the statement of the first informant concerning the respective question. *“I think I could also get it because when I was vaccinated, the woman from the primary health center said that if I have been vaccinated and I get COVID-19, it will not be bad, which means you can still endure it”* This statement is in line with what was reported by the second informant, saying *“Yes, what I heard on the news was that people who have been vaccinated, they can get sick because of COVID-19, some even died. That is why I do not want to be vaccinated; let it be; what is the point of being vaccinated if it only makes us sicker?”*

Regarding the function of the COVID-19 vaccine, both informants showed different knowledge and attitudes. The first informant recalled the information he had received from the health workers saying that the COVID-19 vaccine is to prevent people from suffering from worse symptoms of COVID-19. In contrast, the second informant reported his uncertainty about the function of the COVID-19 vaccines. His statement proves this: *“Ash, I do not know what the function is. Some say they do not get COVID-19, but some say they have been vaccinated;*

*instead, they get COVID-19, so they do not know the point of being immunized with the vaccine.”* The second informant showed he received different information from different sources: *“Some say they do not get COVID-19, but some say they have been vaccinated; instead, they get COVID-19, which might affect his knowledge and attitude.*

Regarding compliance with health protocols upon the vaccination, it was found that both informants agreed to continue practising health protocols even though they had received the vaccination. Similar to previous questions, the first informant repeated what he remembered being told by the health worker, saying, *“The health worker from the health center said that our symptoms will not be worse if we have received the vaccine, but we are on guard, even getting the common cold can make us uncomfortable, right, so we just avoid it”*. This statement is supported by the second informant, stating *“health protocol means wearing masks, right, yes, they have to be vaccinated or not vaccinated, right? So that we do not get infected by the COVID-19”*. From this statement, the second informant sounded hesitant about his knowledge and asked for confirmation from the interviewer. After the confirmation, he agreed that not only those vaccinated but also those who have not had to wear masks to protect them from COVID-19 as everyone might have contact with the disease.

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Regarding the knowledge and attitude of the elderly towards implementing COVID-19 vaccination, the health worker agreed that the older adults had limited knowledge of the COVID-19 vaccination program. Besides, the health worker reported that the elderly tended to have a negative attitude toward the program even though they had tried to approach the elderly by visiting and reminding them to be vaccinated. Moreover, the health worker also added that the elderly deliberately made excuses when invited to participate in the program. That can be seen from what the health worker stated. *"In my opinion, yes, their knowledge about the COVID-19 vaccine is indeed lacking; why I say that because those who registered to take the vaccine said "No." we even came to their house to tell them their schedule for the vaccine, you know what they said, ah later, Anyway, I am also healthy, we do not have COVID-19 in this house, there is also a party for our relatives on that date, nurse, later when the time comes, we will, that is what he said, even though it is for their interests, this vaccine, right?"*

In order to increase the elderly's participation in the COVID-19 vaccination program, the health worker informant suggested that they should be more educated. It is not only the elderly who should be informed, but also the family members and community, so that their awareness of the importance of the COVID-19 vaccine could be raised. Furthermore, it was added that health workers should be more active in approaching people by visiting their houses and giving reliable information to the elderly to enhance their knowledge and consequently grow positive attitudes. According to the informant, they had visited several households with older adults in the area but had yet to visit all. Besides,

the health worker also reported that the counselling they had provided to the community had yet to be optimal.

#### 4. DISCUSSIONS

This study found that the percentage of elderly with high knowledge of COVID-19 vaccination was relatively small (27.3%). It was also found that the respondents' knowledge level was followed by the category of their behaviour, shown by  $p$  value = 0.004 ( $p < 0.05$ ). This value indicates a significant relationship between knowledge and behaviour in elderly respondents in this study.

The finding of this quantitative data is supported by the results of the interview with two informants. Their responses to the questions depict that limited knowledge of the function and benefits of the COVID-19 vaccine and health protocols practised upon receiving the vaccine could be associated with their minimal participation in the vaccination program. Besides, misleading information from unreliable sources could also determine their willingness to receive the vaccine, as can be seen from the statements of the two informants. For example, having been informed by a health worker, who could be considered a reliable source of information, the first informant was inclined to have more knowledge and show more positive attitudes than his counterpart. On the other hand, the second informant received information concerning the vaccination program from the family members and surroundings, which eventually resulted in his absence. In addition to this, the results of respondents' limited knowledge were also supported by the health worker informant's statements as he literary stated that the limited knowledge of the elderly had caused them to have little awareness of the importance of the program.

Despite the low level of knowledge, this study found that knowledge and behaviour were associated with receiving COVID-19 vaccination. A high level of knowledge of an individual is inclined to determine his or her behaviour concerning COVID-19 vaccination and vice versa. Limited knowledge of older

adults on COVID-19 vaccination can be due to the education and whether or not the source they access the information from is reliable, as suggested by the theory and research results. The small number of respondents with higher education degrees could explain why this study obtained a low level of knowledge on COVID-19 vaccines. Individuals' education level is likely linear to their capability to understand particular information critically. It can be seen from the results of the cross-tabulation between education and knowledge, which found that respondents with lower education were more likely to have less knowledge (62.5%). Likewise, with sources of information, it can be seen from the results of qualitative research of the first informant that he relied on his knowledge of COVID-19 vaccines and what had been informed by the health workers. their willingness to get COVID-19 immunization in Ethiopia [19].

According to Verplanken, personal experiences shape attitudes that leave a strong impression [20]. Attitudes will be formed more quickly if the personal experience occurs in a situation that involves emotional factors. The influence of people considered necessary generally tends to cause a conformist attitude in the influenced person or the same direction as the attitude of the person who is considered necessary. This tendency is motivated by the desire to be affiliated and avoid conflict with people considered essential. Besides, culture may also play a role in influencing one's attitude to certain things as it can give a style to the experiences of individuals in the community. Consequently, without realizing it, culture has influenced people's attitudes towards various problems; thus, mass media should be factual and objective in conveying and influencing their audiences' attitudes. Educational and religious institutions where moral concepts and teachings are obtained also greatly determine the belief system. Therefore, it is not surprising that, in turn, these concepts influence attitudes.

Our study was in line with a study conducted in Germany about factors affecting citizens' objections to receiving COVID-19 vaccines. The study found low perceived benefits

of vaccination, low perceived risks of contracting COVID-19, health concerns, lack of information, systemic mistrust and spiritual or religious reasons. The analysis reveals a lack of information among users, and misleading information about COVID-19 and vaccination contributes to the objection. Users felt they were inadequately informed about vaccination or did not understand the information available. These information gaps may be related to information not being sufficiently sensitive to the target group's needs. In addition to limited information for the general population, misinformation on the internet can also be a determining reason for refusing vaccination. This emphasized that news from the mass media or others can influence people's attitudes towards the information they receive [21].

Another qualitative study in Ireland also found that vaccine hesitancy identified by critical informants largely fell under the WHO '3Cs' model of hesitancy: lack of confidence in the vaccine and its providers, complacency towards the health risks of COVID-19, and inconvenient access conditions. COVID-19 Communications emerged as a fourth 'C' whereby unclear and negative messages, confusing public health measures, and unmet vaccine effectiveness expectations exacerbated anti-authority sentiments and vaccine scepticism during the pandemic [22]. Similar findings were also reported by a study conducted in Nigeria, suggesting 33 different conspiracy theories or misinformation participants had heard about the COVID-19 virus, pandemic response, or vaccine [23], explaining their hesitancy in participating in the COVID-19 vaccination program.

The present study has several limitations namely the small number of respondents and the location of the research. The relatively small number of samples in the quantitative data affects the results and conclusion despite the fact that there were relationships between knowledge, attitude, and behavior of elderly toward the implementation of COVID-19 vaccination. In addition to this, the small number of informants in qualitative data collecting (which only included 3 informants) does not conform to the



Consolidation Criteria for Qualitative Research Report. In terms of location, the results of this study cannot be used as a generalization in all provinces in Indonesia since Nias Island is one of the frontier, outermost and least developed areas in Indonesia.

The COVID-19 pandemic, which has caused a dramatic increase in the death rate in Indonesia, particularly in the older adult population, results in the urgency of vaccination administration to the vulnerable group. People must understand the relationship between knowledge, attitude, and community behaviour toward implementing the COVID-19 vaccination program, eventually leading to a decline in the death rate due to COVID-19 infection. This article identifies the knowledge, attitude, and behaviour of the elderly toward implementing the COVID-19 vaccination program since this age group is vulnerable. Appropriate counselling and health education programs from health workers in rural and remote areas may improve the completion of the national target of vaccine administration in Indonesia.

## 5. CONCLUSION

This study concludes that the elderly in Teluk Dalam had a low level of knowledge, with negative attitudes and poor behaviour toward implementing the COVID-19 vaccination. There was also a significant relationship between knowledge and behaviour, as well as attitudes and behaviour of the elderly towards implementing the COVID-19 vaccination. The result was supported by qualitative results that the elderly know very little about the benefits of the COVID-19 vaccine in Teluk Dalam, South Nias District. Therefore, it is suggested that to enhance their knowledge of the COVID-19 vaccination, the elderly should be given relevant counselling, which will eventually increase their participation in the vaccination program as their attitude and behaviour positively change. In addition, the public should seek information from reliable sources regarding implementing the COVID-19 vaccination. We hope that further study can conduct more research on

implementing the COVID-19 vaccine and the importance of the COVID-19 vaccination.

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## 7. COMPETING INTERESTS

The authors declare no conflict of interest.

## 8. ETHICAL APPROVAL

This study was approved by the Review Boards of the Health Research Ethical Committee of Sari Mutiara Indonesia University (No.747/F/KEP/USM/V/2021). All respondents received informed consent about the research before conducting the study.

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