

Research Article

Knowledge, Perception, and Acceptance of COVID-19 Vaccination among the Public in Aikmel Health Care Center, East Lombok, West Nusa Tenggara, Indonesia: Cross-sectional Study

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Abstract.

This study aimed to determine the degree of knowledge, perception, and acceptance of the COVID-19 vaccine and to investigate the predictors of the willingness to accept the COVID-19 vaccine at the Aikmel Health Center. This cross-sectional study was conducted by distributing questionnaires to people who visited the Aikmel Public Health Center in July-August 2021, and 110 respondents were selected. A validated self-administered questionnaire was used for data collection. Descriptive statistics were used to analyze participants' characteristics, knowledge, perception, and acceptance of the COVID-19 vaccine. Data were analyzed using Chi-Square and Binary Logistic Regression. It was found that 80.8% of respondents had good knowledge, 54.8% had positive perceptions, and 55.8% had high acceptance of the COVID-19 vaccine. There was a significant correlation between knowledge ($p=0.035$) and perception ($p=0.000$) with the acceptance of the COVID-19 vaccine. Predictors of the COVID-19 vaccine acceptance included having a positive perception of the vaccine (odds ratio [OR] 27,578) and having a history of COVID-19 vaccination (OR=3.999) with a CI of 95%. Knowledge about COVID-19 was good. Moreover, the perception and acceptance of the COVID-19 vaccine was more than half. Educational interventions are needed to reduce misperceptions and increase public acceptance of the COVID-19 vaccine.

Keywords: COVID-19, vaccine, knowledge, perception, acceptance

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1. Introduction

In December 2019, the first case of COVID-19 was discovered in Wuhan, China. In just a few months, the virus spread rapidly and became an outbreak in various countries. This virus is a new type of coronavirus. WHO named this virus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and the disease is called Coronavirus disease

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2019 (COVID-19) (1). After SARS-CoV-2 was identified as the causative agent and the viral genome sequence was published, vaccine development began at several research centers and pharmaceutical companies. On March 16, 2020, the first COVID-19 vaccine candidate, an mRNA-based vaccine developed by the company Moderna, entered Phase 1 clinical trials in the United States, and later a non-replicating vector-based vaccine developed by China CanSino Biologics was also tested in China (2).

On March 2, 2020, the first COVID-19 case in Indonesia was announced, and the number continues to increase daily (3). In early October 2020, the President issued presidential decree No. 99 of 2020 regarding procuring vaccines and implementing national vaccination plans to address the COVID-19 pandemic. The regulation explains that the Government will prepare vaccine procurement, distribution, and implementation of the national vaccination program (4).

Based on a survey conducted by the Ministry of Health (MoH) in September 2020 in collaboration with ITAGI and with the support of UNICEF and WHO, 112,888 respondents from all over Indonesia showed that around 74% of respondents stated that they knew quite a lot about the Government's plan to roll out a national COVID-19 vaccination program. Public knowledge related to the COVID-19 vaccination program varies from the province. In West Nusa Tenggara Province, public knowledge is still relatively low, with only 69% of respondents who know the information (4).

People choose not to accept vaccines because the context is specific, varying by time, place, and type of vaccine. This condition is generally influenced by factors such as compliance, convenience, and confidence (5). In Indonesia, the acceptance of the COVID-19 vaccine is also influenced by the effectiveness of the vaccine. Acceptance is relatively high when the vaccine's effectiveness is very high and decreases when the vaccine's effectiveness is low. If the COVID-19 vaccine has lower effectiveness than others, the Government must prepare more strategies to persuade the public to be willing to be vaccinated (6).

Vaccine-related doubts, reluctance, and rejection have been ranked by WHO as one of the top 10 global health threats in 2019. On the other hand, vaccination is one of the most cost-effective strategies to prevent disease. In 2019 alone, 2-3 million deaths could be prevented in a year with vaccines, and another 1.5 million are expected to be avoided if global coverage of vaccinations continues to increase (7). In Indonesia, the survey found that 8% of people still refuse to receive the COVID-19 vaccine, 27% of the public expressed doubts, and 65% of others expressed willingness to receive the COVID-19 vaccine when provided by the Government. In West Nusa Tenggara Province

alone, only 58% of respondents are willing to receive the COVID-19 vaccine, below the average national acceptance value (4).

Perception is an aspect of human psychology vital in responding to various environmental aspects and symptoms. The meaning of perception is comprehensive, involving internal and external. Perception refers to a process that starts from seeing until the response is formed in a person; so that he is aware of all things in his environment through his five senses (8).

The Health Belief Model (HBM) was first developed around 1950 by social psychologists from the US Public Health Service. HBM theory was developed from the need to understand better and explain why individuals often fail to accept and engage in disease prevention and detection treatment programs such as early disease screening (9). According to Hochbaum (10), the basic concept of the HBM theory is that health behavior is determined by a person's personal beliefs or perceptions about a disease and the strategies available to lower its occurrence. It was further explained that many intrapersonal factors influence a person's perception of health behavior, such as knowledge, belief, experience, culture, and others.

According to Irwan (11), knowledge results from knowing, created after the individual senses an object. Without knowledge, a person does not have a basis for making decisions and determining actions to deal with problems. Each person's knowledge will differ depending on how he senses an object or something.

2. Materials and methods

This study used a quantitative analytical observational method with a cross-sectional design and was conducted at Aikmel Health Center. This health center is located in Aikmel District, East Lombok Regency, West Nusa Tenggara Province, Indonesia.

Data were collected by distributing questionnaires directly to people who visited the Aikmel Health Center from July to August 2021. The sample selected in this study was people who met the predetermined criteria. The inclusion criteria in this study were that the respondent must reside in the working area of the Aikmel Health Center, be 18 years old or older, be able to speak Indonesian orally and in writing, and be willing to become a respondent by agreeing to the informed consent form.

We developed a new questionnaire to assess people's level of knowledge, perception, and acceptance of the COVID-19 vaccine. Several sections of this questionnaire were adapted and developed from a validated questionnaire used in similar previous studies (12). A pilot study was conducted among 30 respondents at Kalijaga Healthcare

center in East Lombok Timur. The questionnaire was tested for validity and reliability again on a population similar to the population where the study is located (13). The previous pilot study's result certified that all questionnaire items are valid and reliable, with 0.862 as the reliability value. Questionnaires that have passed the validity and reliability tests are then used in the study (14). This questionnaire consists of five parts: Socio-demographic characteristics, characteristics related to the COVID-19 vaccine; public knowledge of the COVID-19 Vaccine; public perception of the COVID-19 vaccine; and public acceptance of the COVID-19 vaccine.

The characteristics of the sample, knowledge, perception, and acceptance are presented descriptively based on the final results of the questions. Knowledge is categorized as good, sufficient, and less based on the score determined in each group (15). Perceptions were categorized as positive and negative perceptions using the median cut-off score for each group. Meanwhile, acceptance is categorized as high and low acceptance by using the median cut-off score in each group (12). Descriptive analysis was used to examine socio-demographic characteristics, vaccine-related characteristics, level of knowledge, perception, and acceptance of COVID-19 vaccine respondents. The relationship between respondent characteristics, knowledge, and perception of the acceptance of the COVID-19 vaccine was analyzed using Chi-Square statistical tests and Binary Logistic Regression.

This research has received ethical approval from the Health Research Ethics Committee of the University of Muhammadiyah Malang (No. E.5.a/131/KEPK-UMM/VI/2021). We facilitate Informed consent for each respondent about the details of our study, such as objectives and information on the privacy of participant's data.

3. Results

The results of this study showed the participation of as many as 110 respondents. After checking the completeness of the data, it was found that 104 respondents had complete data and were eligible for analysis. The socio-demographic characteristics of respondents in this study describe the diversity of respondents based on gender, age, occupation, average monthly family expenditure, education, religion, and distance from residence to health facilities.

The results showed that 55.8% of respondents were female, with the majority of respondents aged between 46-55 years, as many as 24%. Most respondents did not work and became housewives, 26.9%. The average monthly expenditure range for the respondent's family with the highest amount is IDR 2,128,0001 - IDR 4,800,000, which is

as much as 36.5%. Most respondents completed higher education, as much as 46.2%. Almost all respondents are Muslim, which is 99.0%. Respondents also mostly live ≤ 3 Km from the nearest health facility (Table 1).

This study showed that almost all respondents had never been infected with COVID-19 (96.2%). Furthermore, they did not have a family who had been infected with COVID-19 (82.7%). About 59.6% of respondents have not received a vaccine shot, and the remaining 40.4% have received at least the first dose of the COVID-19 vaccine. On the other hand, 77.9% of respondents' families/relatives have received at least the first dose of the COVID-19 vaccine. Most respondents get information about COVID-19 from TV, which is 27.9% (Table 1).

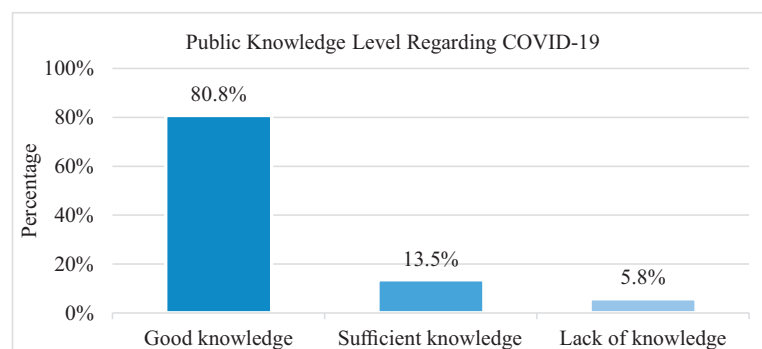


Figure 1: Public Knowledge Level Regarding COVID-19.

In this study, the results of the respondents' knowledge were still varied. This study's results indicate that most respondents have good knowledge. 80.8% of respondents have good knowledge of COVID-19, 13.5% have sufficient knowledge, and 5.3% have less knowledge (Figure 1). Based on the distribution of answers, it is obvious that respondents' knowledge of COVID-19 is still quite varied on the topics asked. About 79.8% of respondents know that COVID-19 is a dangerous disease. The number of respondents who know that COVID-19 is a disease that attacks the respiratory tract is very high at 94%. In addition, almost all respondents also know the symptoms of COVID-19, which is 95.2%. Regarding the mechanism of transmission of the COVID-19 virus, as many as 87.5% already have good knowledge. Prevention of transmission of COVID-19 with vaccines as a solution is known by 81.7% of respondents (Table 2).

After the respondents' answers to their perception of the COVID-19 vaccine were analyzed, a cut-off point of 34 was obtained. Respondents with a score of < 34 were categorized as having negative perceptions, and respondents with a score of ≥ 34 were categorized into positive perceptions. 54.8% of respondents were found to have a positive perception of the COVID-19 vaccine. In addition, another 46.2% of respondents negatively perceived the COVID-19 vaccine (Figure ??). Assessment of public perception

TABLE 1: Socio-demographic and vaccine-related characteristics Respondents.

Category	n (%)
Gender	
Man	46 (44.2)
Woman	58 (55.8)
Age	
18-25	19 (18.3)
26-35	24 (23.1)
36-45	21 (20,2)
46-55	25 (24.0)
56-65	9 (8,7)
> 65	6 (5.8)
Occupation	
Unemployed, including students and housewives	28 (26.9)
Farmer	6 (5.8)
Daily labor/Driver/Housemaid	5 (4.8)
Private employees	14 (13.5)
Civil Servant/Army/Police/State-owned enterprises/Regional-owned enterprises	13 (12.5)
Self-employed/Entrepreneur	21 (20,2)
Schools and other educational institutions	17 (16.3)
Average household's monthly expense	
< IDR 1,416,000	20 (19.2)
IDR 1,416,000 – IDR 2,128,0001	35 (33.7)
IDR 2,128,0001 – IDR 4,800,000	38 (36.5)
IDR 4,800,000 – 24,000,000	11 (10.6)
> IDR 24,000,000	0 (0,0)
Highest education level	
Low (Elementary school or lower)	7 (6,7)
Intermediate (Junior High School – Senior High School)	49 (47,1)
High (Graduated Diploma/Bachelor/Master/Doctorate)	48 (46.2)
Religion	
Islam	103 (99.0)
Hindu	1 (1.0)
Other	0 (0,0)
Distance from residence to health facilities	
≤3 Km	83 (79.8)
>3 Km	21 (20,2)
History of being infected with COVID-19	
Yes	4 (3.8)
No	100 (96.2)

TABLE 1: (Continued).

Known any family members, relatives, or friends infected with COVID-19	
Yes	18 (17.3)
No	86 (82.7)
Have been vaccinated against COVID-19	
Yes	42 (40.4)
Never	62 (59.6)
Known any family members, relatives, or friends received the COVID-19 vaccine	
Yes	81 (77.9)
No	23 (22.1)
Source of COVID-19 vaccine information	
Family/Friends	21 (20,2)
Internet	28 (26.9)
TV	29 (27.9)
Health workers	26 (25)

TABLE 2: Respondent’s Knowledge Answers Regarding COVID-19.

No.	Question	Right N(%)	Wrong N(%)
1*	COVID-19 is not a severe disease and is just like the common cold	21 (20,2)	83 (79.8)
2	COVID-19 is fever ($\geq 38^{\circ}\text{C}$) or a history of fever accompanied by one of the symptoms/signs of a respiratory illness such as cough/shortness of breath/ sore throat/ runny nose/ mild to severe pneumonia.	99 (95.2)	5 (4,8)
3	COVID-19 is a virus that infects the respiratory tract	98 (94.2)	6 (5,8)
4	Shaking hands or touching objects that contain the COVID-19 virus and then touching your mouth, nose, or eyes before washing your hands can catch the COVID-19 virus	91 (87.5)	13 (12,5)
5	A covid-19 vaccine can be used to prevent Covid-19 disease	85 (81.7)	19 (18.3)

Note: *unfavorable statement item

in the working area of Aikmel Health Center on the COVID-19 Vaccine was carried out with the health belief model (HBM) theory approach.

Figure ??. Public Perception Regarding COVID-19

In this study, the perceived severity of respondents to COVID-19 disease found that most respondents (88.5%) consider COVID-19 a severe disease. Perceived susceptibility is described through four question items. Most respondents thought they felt at risk of COVID-19 (64.4%). The question item related to respondents’ perceptions about their

risk of getting COVID-19 is the question with the lowest percentage of the correct answer. From the next question point, it was found that respondents preferred to be vaccinated rather than get natural immunity by contracting the COVID-19 virus (77.9%). Most of them assume that they will be affected by COVID-19 if they are not vaccinated (71.2%). In addition, they said they did not regret having been vaccinated even though the outbreak was not severe (80.8%). Perceived benefits are described through two question items. The assessment results show that most people in the working area of the Aikmel Health Center have a positive perception of the benefits of the COVID-19 vaccine. as many as 81.7% of respondents believed that the vaccine would protect them from COVID-19. Most also think a COVID-19 vaccine is needed (88.4%). Perceived barriers were observed through two question items. Only a tiny percentage of respondents have incorrect assumptions (negative perceptions) related to the COVID-19 vaccine. They think the COVID-19 vaccine has serious side effects (31.7%). A few respondents also doubt the vaccine's safety (22.1%). In addition to the four previous perception sub-variables, cues to action were also investigated. From the respondents' answers, it was found that most respondents thought that the vaccine worked well, so they were not reluctant to be vaccinated (80.8%). In addition, many respondents felt the need to be vaccinated because their family, friends, or neighbors were infected with COVID-19 (72.1%) (Table 3).

This study's acceptance analysis of the COVID-19 vaccine results obtained a median score of 13 (cut-off point). Respondents with a score of <13 were categorized into low acceptance, whereas respondents with a score of ≥ 13 were categorized into high acceptance. Public acceptance of the COVID-19 vaccine found that 55.8% of respondents had high acceptance, and another 44.2% had low acceptance of the COVID-19 vaccine (Figure 2). Based on the distribution of answers, it is evident that about 85.6% of respondents are willing to be vaccinated to prevent exposure to COVID-19 and are also willing to be vaccinated when offered as one way to stop the pandemic (86.5%). Most respondents are willing to be vaccinated against COVID-19 if it is offered at a local health facility (86.5%) (Table 4).

Table 5 shows a correlation between knowledge and perception with the acceptance of the COVID-19 vaccine. Knowledge was found to correlate significantly with acceptance of the COVID-19 vaccine ($p=0.035$). The perception was also significantly correlated with acceptance of the COVID-19 vaccine ($p<0.001$).

Multivariate analysis using the Binary Logistic Regression method was conducted to see if there was a relationship between some independent variables and the acceptance of the COVID-19 vaccine in the community at Aikmel Health Center. Positive perception

TABLE 3: Respondents' Perceptions Regarding the COVID-19 Vaccine.

Statement	Strongly Disagree N(%)	Disagree N(%)	Agree N(%)	Strongly Agree N(%)
Perceived severity				
I consider coronavirus disease or COVID-19 a serious disease	1 (1.0)	11 (10.6)	49 (47.1)	43 (41.3)
Perceived susceptibility				
I feel that I am at high risk got COVID-19	8 (7.7)	29 (27.9)	51 (49.0)	16 (15.4)
I think it's better to get natural immunity by catching COVID-19	39 (37.5)	42 (40.4)	18 (17.3)	5 (4.8)
Without the COVID-19 vaccine, it's likely that I will catch COVID-19	1 (1.0)	29 (27.9)	63 (60.6)	11 (10.6)
If the pandemic turn out not to be severe, I would regret about being vaccinated against COVID-19	29 (27.9)	55 (52.9)	15 (14.4)	5 (4.8)
Perceived benefits				
COVID-19 vaccine will protect me against Coronavirus Disease (COVID-19)	3 (2.9)	16 (15.4)	60 (57.7)	25 (24)
COVID-19 vaccine is not necessary	43 (41.3)	49 (47.1)	8 (7.7)	4 (3.8)
Perceived barriers				
COVID-19 vaccine has serious side effects	6 (5.8)	65 (62.5)	25 (24)	8 (7.7)
I doubt the safety of the COVID-19 vaccine	10 (9.6)	71 (68.3)	17 (16.3)	6 (5.8)
Cues to action				
I don't think the COVID-19 Vaccine is working well, so I don't want to Vaccinated	20 (19.2)	64 (61.5)	18 (17.3)	2 (1.9)
There are people around me, such as family, neighbors, or friends, whom COVID-19 infects, so I think I need to be vaccinated	3 (2.9)	26 (25.0)	53 (51.0)	22 (21.2)

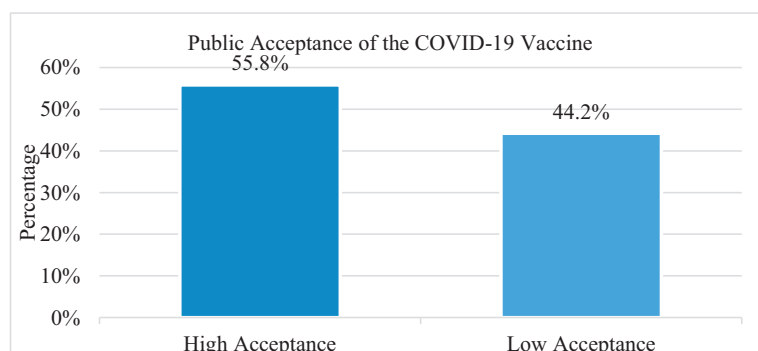


Figure 2: Public Acceptance of the COVID-19 Vaccine.

of vaccines (OR 27,578; 95% CI, 7,501 – 101,397) and having a history of vaccination

TABLE 4: Respondents' acceptance regarding the COVID-19 Vaccine.

No.	Acceptance statement	Strongly Disagree N(%)	Disagree N(%)	Agree N(%)	Strongly Agree N(%)
1	I will be willing to be vaccinated against COVID-19 to prevent myself from getting coronavirus disease (COVID-19)	2 (1.9)	13 (12.5)	36 (34.6)	53 (51.0)
2	I would be willing to be vaccinated against COVID-19 if offered as a way to stop the pandemic	1 (1.0)	13 (12.5)	40 (38.5)	50 (48.1)
3	I would be willing to be vaccinated against COVID-19 if offered at the facility local health	0 (0,0)	14 (13.5)	45 (43.3)	45 (43.3)
4	I will be willing to be vaccinated against COVID-19 even though I am very busy	4 (3.8)	23 (22.1)	47 (45.2)	30 (28.8)

TABLE 5: Relationship between Knowledge and Perception of COVID-19 Vaccine Acceptance.

Category	Reception		p Value
	High n(%)	Low n(%)	
Knowledge			
Good knowledge	52 (89.7)	32 (69.6)	0.035*
Sufficient knowledge	4 (6.9)	10 (21.7)	
Lack of Knowledge	2 (3.4)	4 (8.7)	
Perception			
Positive	49 (84.5)	8 (17.4)	0.000*
Negative	9 (15.5)	38 (82.6)	

at least the first dose of COVID-19 (OR 3,999; 95% CI, 1,114 – 14,355) is the dominant predictor of COVID-19 vaccine acceptance (Table 6).

4. Discussion

This study examines the knowledge, perception, and acceptance of the community at the Aikmel Health Center towards the COVID-19 vaccine. Knowledge is an essential domain in shaping one's actions (16). The univariate analysis of respondents' knowledge showed that 80.8% had good knowledge of COVID-19. The results of this study follow research conducted by Moudy and Syakurah found that most respondents had good knowledge. Based on the distribution of answers related to the knowledge of respondents who have been previously described, it is evident that public knowledge in the working area of Aikmel Health Center against COVID-19 is still quite diverse, with a range between 79.8%-95.2%. Respondent's knowledge of the severity of COVID-19 disease is still relatively low compared to other question topics because most

TABLE 6: Multivariate Analysis of COVID-19 Vaccine Acceptance.

Variable	Sig.	OR	95% CI
Gender			
Man		1	
Woman	0.559	0.694	0.204 – 2.360
Education			
Low		1	
Intermediate	0.372	2,964	0.272 – 32.273
High	0.818	1.326	0.119 – 14,788
COVID-19 Survivors			
No		1	
Yes	0.934	1.144	0.048 – 27.479
COVID-19 vaccine history			
Never		1	
Yes	0.034*	3,999	1.114 – 14, 355
Source of COVID-19 vaccine information			
Family/friends		1	
Internet	0.093	4,152	0.790 – 21.811
TV	0.993	1.008	0.185 – 5.476
Health workers	0.426	2.039	0.353 – 11.760
Knowledge level			
Lack of Knowledge		1	
Sufficient knowledge	0.890	0.829	0.057 – 11.966
Good knowledge	0.957	0.938	0.094 – 9.372
COVID-19 Vaccine Perception			
Negative		1	
Positive	0.000*	27,578	7.501 – 101.397
*significance at p<0.05			

respondents answered incorrectly (79.8%) in this question item. The study conducted by Moudy and Syakurah (17) also found that respondents still lacked knowledge regarding the severity of COVID-19.

This study found that only slightly more than half of the respondents had a positive perception of the COVID-19 vaccine, which was only 54.8%. These results are in line with research conducted in Nigeria by Adejumo, Ogundele, Madubuko, et al. (18). In another study conducted in Southeast Sulawesi by Tasnim (19), perceptions are divided into three categories, namely good, sufficient, and poor, it was found that the majority of people have sufficient perception of 59.0%. The amount of wrong and misleading information (hoaxes) circulating in the community could be one of the causes of a

wrong public perception of the COVID-19 vaccine. Based on Kominfo data until August 2, 2021, at least 1,819 hoax content circulating COVID-19 in Indonesia were found (20).

Public perception in the working area of Aikmel Health Center on the COVID-19 Vaccine was observed with the health belief model (HBM) theory approach. The basic concept of this theory is that health behavior is determined by a person's perception of a disease and the strategies available to overcome it (10). The perceived severity of COVID-19 felt by respondents is very high, and almost all (88.5%) consider COVID-19 a severe disease. According to the HBM theory put forward by Rosenstock in 1974, the perception of a disease's seriousness or severity causes a person to have an attitude to make a treatment effort (21). Recent studies on acceptance of the COVID-19 vaccine found that participants with high perceived severity were more likely to obtain the COVID-19 vaccine (22–24).

The perceived susceptibility of respondents was found to be diverse and relatively high. The most exciting result is that many respondents still consider that they are not at risk of COVID-19 (35.6%). This result can be obtained because most respondents come from age groups not susceptible to COVID-19 (<60 years), so they feel not at high risk for COVID-19 infection. This assumption is certainly wrong because based on data from the COVID-19 Handling Task Force (25) until September 28, 2021, shows that about 75.2% of positive cases of COVID-19 are in communities with an age range of 19-59 years (<60 years).

The majority of respondents were found to have a high perceived benefit. About 81.7% of respondents thought the vaccine would protect them from COVID-19. Most also think a COVID-19 vaccine is needed (88.4%). This current finding shows that most respondents are aware of the benefits they will get if they vaccinate. A study conducted in Malaysia stated that the perceived benefit had a significant correlation with the acceptance of vaccines, especially the COVID-19 vaccine (26).

In HBM theory, perceived barriers are defined as possible obstacles to taking action, which can include negative consequences resulting from an action. These perceived obstacles and negative consequences hinder subsequent actions or involvement in behavior. Obstacles may include inconvenience, cost, or fear of screening procedures (27). In this study, the perceived barrier that respondents most widely perceived were the assumption that the COVID-19 vaccine had severe side effects (31.7%). These results also align with other findings in this study, where most respondents are unwilling to receive the COVID-19 vaccine because of fear of side effects from the COVID-19 vaccine. Respondents with a positive view of perceived barriers tend to accept a new health behavior (28), which in this study is vaccinating against COVID-19. Contrary to

respondents who have serious concerns about possible barriers, they are more at risk of rejecting new health behaviors, and in this study, they will be more at risk of choosing not to be vaccinated (21).

In this study, we also observed sub-variable cues to action. These triggers for action can be events, people, or other things that encourage individuals to change their behavior or accept new health behaviors (10). This study found that many respondents thought the vaccine worked well (80.8%), and many of the respondents felt the need to be vaccinated because there were family, friends, or neighbors who contracted COVID-19 (72.1%). These results showed that most respondents were aware of the triggers to act around them. Because respondents believe that the vaccine works well and their family, friends, or neighbors are infected by COVID-19, they should be vaccinated against COVID-19.

Respondent's acceptance of the COVID-19 vaccine showed that only 55.8% of respondents had a high acceptance of the COVID-19 vaccine. It should be noted from this result that the group of respondents with low acceptance does not always mean that they refuse or do not receive the vaccine. In the group of respondents with low acceptance and those who refuse to receive the COVID-19 vaccine, some are still unsure or choose to delay until the time is right to receive the vaccine. A survey conducted in Indonesia found that groups of respondents choose to wait and see while continuing to update vaccine developments from time to time. This result could have been obtained because respondents were still unsure, primarily because of the many misleading news (hoaxes) about the COVID-19 vaccine. A survey conducted by the Ministry of Health of Indonesia (4) related to accepting the COVID-19 vaccine in Indonesia found that about 65% of respondents are willing to accept the COVID-19 vaccine. In addition, 27% of respondents are still hesitant to receive the COVID-19 Vaccine, and 8% of other respondents refuse to accept the COVID-19 Vaccine.

The majority of respondents are unwilling to accept the vaccine because they are afraid of the side effects of the COVID-19 vaccine (32.1%). These results align with the results of research by Febriyanti, Choliq, and Mukti (29), which also found that respondents disagreed with being vaccinated because they were afraid of the side effects of the COVID-19 vaccine. Another survey conducted on a larger scale found different results where the main reason Indonesian people are not willing to be vaccinated is that they are not sure about its safety (4). The amount of wrong and misleading information (hoaxes) circulating in the community is one of the reasons why the rejection of the COVID-19 vaccine is still high. Based on Kominfo data until August

2, 2021, it was found that at least 1,819 hoax content circulated about COVID-19 in Indonesia (20).

Bivariate analysis to determine factors associated with willingness to receive the COVID-19 vaccine revealed a significant association between knowledge and acceptance of the COVID-19 vaccine ($p = 0.035$). Respondents with good knowledge are more willing to receive the COVID-19 vaccine (89,7 %) than respondents with moderate and lack of knowledge. These results align with the research conducted by Elhadi, Alsoufi, Alhadi, et al. (30), which stated that there was a significant relationship between knowledge and public acceptance of the COVID-19 Vaccine. Another study by Febriyanti, Choliq, and Mukti (29) also shows that knowledge has a significant relationship with the acceptance of the COVID-19 vaccine among residents of Dukuh Menanggal, Surabaya City. Without knowledge, individuals do not have a basis for making decisions and taking action on the problems at hand, which in this study is the respondent's actions to vaccinate against COVID-19 (11).

Respondents' perceptions were also significantly associated with acceptance of the COVID-19 Vaccine ($p < 0.001$). Respondents with positive perceptions were highly accepted, with the highest percentage of 84.5%. Respondents with low acceptance were found to respondents with a negative perception of 82.6%. These results align with research conducted in Nigeria by Adejumo, Ogundele, Madubuko, et al. (18). This shows that in this study, the perception of the COVID-19 vaccine is one of the crucial factors that respondents consider to be willing to accept the COVID-19 vaccine.

In the multivariate analysis, two predictors were found that had a dominant influence on the acceptance of the COVID-19 vaccine, namely the perception of COVID-19 ($p < 0.000$) and characteristics of COVID-19 vaccine history ($p = 0.034$). Positive perception will increase the acceptance of the COVID-19 vaccine. Respondents with positive perceptions were found to be 27,578 times more willing to receive the COVID-19 vaccine compared to respondents with negative perceptions. In this study, perceptions were assessed using the Health Belief Model approach. According to Becker (1974), the Health Belief Model states that everyone must be willing to participate in health interventions or behaviors based on a positive perception that health is a precious outcome (28). Therefore, perceptions can influence a person to accept new health behaviors, which in this study are willing to receive the COVID-19 vaccine.

Research by Erawan, Zaid, and Pratondo et al.(23), which also uses the HBM approach to assess public perceptions of the COVID-19 vaccine in Yogyakarta, found that there is a significant association between willingness to receive the COVID-19 vaccine and HBM. Therefore, it is recommended that the Government understand the public's

perceived susceptibility, severity, benefits, and barriers related to COVID-19 so that it can provide an opportunity to develop more effective education related to mass vaccination programs that Government is programming.

In addition, concerning the characteristics of the COVID-19 vaccine history, it was found that respondents with a history of having received at least the first dose of the COVID-19 vaccine were 3.999 times more likely to be willing to receive the COVID-19 vaccine compared to respondents who had no history of receiving the COVID-19 vaccine. Another study by Gallè, Sabella, and Roma et al.(31), explained that respondents who previously had a history of receiving influenza vaccine in 2019/2020 had a 3,806 times higher probability of being willing to receive the COVID-19 vaccine than respondents who did not vaccinate. In addition, the results of research by Alqudeimat, Alenezi, and AlHajri et al.(32) also showed that respondents who previously had a history of having received an influenza vaccine were at least 1.35 times more likely to receive a COVID-19 vaccine compared to respondents who had never received an influenza vaccine

5. CONCLUSION

In conclusion, public knowledge regarding COVID-19 and the COVID-19 vaccine at the Aikmel Public Health Center, East Lombok Regency, West Nusa Tenggara Province, Indonesia, is relatively good. Contrary to that, public perception and acceptance of the COVID-19 vaccine are still inadequate. In addition, this study also found a significant association between public knowledge and perceptions regarding COVID-19 and acceptance of the COVID-19 vaccine. This study also provides information about factors that predict respondents' willingness to receive the COVID-19 vaccine. The analysis found that the positive perception of COVID-19 and the characteristics of the COVID-19 vaccine history of respondents were the dominant predictor factors for COVID-19 vaccine acceptance.

It is also expected to provide an overview and policy-making for the Government to cope with the spread of COVID-19, especially in East Lombok. More intensive education is needed to increase awareness so that the public avoids the amount of misleading content circulating that can cause negative public perceptions of the COVID-19 vaccine.

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