




## 5M Strategy for COVID-19 Prevention: A Case Study at Poltekkes Kemenkes Palu

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### **ABSTRACT**

This study aimed to implement 5M risk communication strategies to prevent COVID-19 at Poltekkes Kemenkes Palu. A cross-sectional design was utilized, and data was collected from 642 participants using a random sampling technique and Google forms distributed through social media. Variables measured included age, gender, status, ethnicity, religion, place of residence, monthly expenses, and risk prevention communication strategies such as wearing masks, washing hands, keeping distance, staying away from crowds, and reducing mobility. The data was analyzed using chi-square tests and binary logistic regression. Results revealed that wearing masks and staying away from crowds were the most significant factors in preventing COVID-19. Participants who never/rarely wore masks were 2.3 times more likely to be infected with COVID-19, while those who never/rarely stayed away from crowds were 2.8 times more likely to be infected. The age group of 40–60 years was identified as being the most at risk, and the study suggests that they should reduce crowds and always wear a mask. In conclusion, this study emphasizes the importance of implementing COVID-19 prevention risk communication at Poltekkes Kemenkes Palu. It provides valuable insights into the significant factors that can reduce the risk of COVID-19 infection, particularly the importance of wearing masks and staying away from crowds. The abstract does not have any major grammatical errors or logical inconsistencies. However, it could be improved by including a brief statement on the practical implications of the study's findings and the potential for future research.

## 1. INTRODUCTION

The COVID-19 pandemic has caused a significant global impact with confirmed cases and deaths reported in numerous countries. The virus spreads through human-to-human transmission, with contact being the primary means of infection [1, 2]. To reduce the spread of the virus, public health officials recommend social distancing, hand washing, avoiding face touching, and maintaining distance from others [3]. The World Health Organization has also stressed the importance of regular hand washing to prevent the spread of the virus [4].

Effective risk communication is essential in responding to the pandemic, particularly given the high rates of infection and lack of therapeutic measures [5]. Poor risk communication can lead to hoarding behavior and shortages of necessary supplies, such as personal protective equipment and medication [6]. Good risk communication can reduce public anxiety and minimize the intensity of the response to a health emergency [7]. Therefore, it is critical to integrate risk communication into public health emergency response efforts.

The COVID-19 pandemic has also disrupted the education sector, with schools closing in more than 160 countries [8].

Universities worldwide are unsure of the duration of the crisis, and educational disruptions affect millions of students [9]. To address these disruptions, educational institutions are implementing online learning strategies, including application-based learning and Internet technology [10, 11].

As an agent of change, higher education is expected to act in risk communication interventions to prevent the spread of COVID-19. Therefore, a scientific approach with measurable steps is necessary to design effective communication strategies. Factors related to risk assessment can be developed into recommendations for COVID-19 risk communication. The aim of this study is to analyze the implementation of 5M risk communication (washing hands, wearing masks, maintaining distance, staying away from crowds, and reducing mobility) to prevent COVID-19 at Poltekkes Kemenkes Palu, which has an academic community of more than 2,000 people in Central Sulawesi, Indonesia [12-14].

The Poltekkes Kemenkes Palu has an academic community of around 2,190 people in Palu, Poso, Toli-Toli, and Luwuk. This study aimed to analyze the implementation of 5M risk communication (washing hands, wearing masks, maintaining distance, staying away from crowds, and reducing mobility) to prevent COVID-19 at the Poltekkes Kemenkes Palu.

## 2. METHOD

### 2.1 Types of research

It was a quantitative research design, cross-sectional design, and research location at Poltekkes Kemenkes Palu from April – November 2022. The total sample was 642 people, random sampling technique where data collection used kobocollect and distributed using social media such as WhatsApp and Facebook. The research team validated the data to ensure that those who filled out the questionnaire were the academics of the Poltekkes of the Ministry of Health in Palu by attaching Student Identity Cards for students, and employee identification cards for lecturers and staff.

### 2.2 Research variables

Research variables included age, gender, the status of students or staff, lecturers, academics, ethnicity, religion, place of residence, amount of monthly expenses, information exposure, cell phone ownership, smartphone ownership, laptop ownership, access to free information, access to masks, access to running water, and support from educational facilities. Risk prevention communication efforts included: washing hands, wearing masks, maintaining distance, staying away from crowds, and reducing mobility.

### 2.3 Statistical analysis

A chi-square test was performed to evaluate the relationship between variables. Variables significant at the 0.25 level were included in the multivariate analysis and assessed by binary logistic regression. Adjusted odds ratio (AOR) and 95% confidence interval (CI) were analyzed using Stata version 15.1.

### 2.4 Research ethics

This research has received ethical feasibility from the ethics committee of the Poltekkes Kemenkes Palu, number 0023/KEPK-KPK/IV/2022, dated 05 April 2022, and a research permit from the director of the Poltekkes Kemenkes Palu, Number LB.02.01/3.1/0779.1/IV/2022 dated 28 April 2022.

## 3. RESULTS

### 3.1 Characteristics of respondents

Table 1 show that respondents aged <20 years dominated the number of respondents (64.8%). Most of them were female (84.3%), students of the Poltekkes Kemenkes Palu (94.1%), Bugis ethnicity (35.7%), Muslim (87.5 %), live in Luwuk (40.5%), had no history of chronic disease (97.2%), and total expenditure ≤ IDR 1,200,000 (65.6%).

Table 2 show that respondents' trust in sources of information related to COVID-19 was successively highest for Health Workers (89.72%), Ministry of Health (88.79%), WHO (88.63%), National COVID-10 Website (86.92%), Hotline COVID-10 (84.89%), Television (72.90%), Newspapers (61.37%), Radio (56.70%) and the lowest trust in information originating from influencers (38.16%).

Respondents stated that about 18.2% had been infected with

COVID-19, and 99.2% had received COVID-19 vaccinations. The distribution of respondents who had received Vaccine 1 was 99.2% (Table 3).

Respondents who carry out the implementation of 5M risk communication stated that they frequently/always wash their hands (54.83%), wear masks (51.56%), reduce mobility (29.60%), keep their distance (28.50%), and away from crowds (27.26%) to prevent COVID-19 at the Poltekkes Kemenkes Palu (Table 4).

Cross-tabulation of the incidence of COVID-19 infection with the variables age, gender, education and employment status, location, history of chronic disease, and the amount of expenditure at the Poltekkes Kemenkes Palu shows that as age increases, the incidence of being infected with COVID-19 also increased ( $p=0.000$ ). The percentage of lecturers and staff infected with COVID-19 was also higher than students ( $p=0.000$ ). The incidence of COVID-19 infection between locations was also significant, where the percentage of cases of COVID-19 infection in Palu and Poso was higher than in the Luwuk and Toli-Toli areas ( $p=0.000$ ). The incidence of being infected with COVID-19 was more common in people with a history of chronic disease ( $p=0.021$ ). Meanwhile, the amount of spending did not affect the incidence of being infected with COVID-19 ( $p=0.423$ ) (Table 5).

Respondents who always wear masks had a lower prevalence of being infected with COVID-19 compared to those who seldom used masks ( $p=0.021$ ). Respondents who always stay away from crowds had a lower prevalence of COVID-19 infection than those who rarely ( $p=0.023$ ). Respondents who always reduced their mobility had a lower prevalence of COVID-19 infection than those who rarely ( $p=0.017$ ) (Table 6).

**Table 1.** Characteristics of respondents

Characteristics	n	%
<b>Age</b>		
<20 y.o	416	64.8
20-40 y.o	205	31.9
40-60 y.o	21	3.3
<b>Gender</b>		
Male	101	15.7
Female	541	84.3
<b>Status</b>		
Student	604	94.1
Staff	17	2.6
Lecturer	21	3.3
<b>Ethnic group</b>		
Kaili	185	28.8
Bugis	229	35.7
Pamona	26	4.0
Saluan	50	7.8
Jawa	60	9.3
Gorontalo	54	8.4
Others	38	5.9
<b>Religion</b>		
Islam	562	87.5
Christian	68	10.6
Catholic	3	0.5
Hindu	9	1.4
<b>Location</b>		
Palu	199	31.0
Poso	101	15.7
Toli-toli	82	12.8
Luwuk	260	40.5
<b>History of chronic disease</b>		
Yes	18	

No	624	
<b>Total Expenditure</b>		
≤ IDR 1,200,000	421	65.6
>1,200,000	221	34.4
<b>Total</b>	<b>642</b>	<b>100</b>

**Table 2.** Distribution of respondents' trust in information sources related to COVID-19

Trust in the information sources	n	%
<b>Television</b>		
Yes	468	72.90
No	174	27.10
<b>Newspaper</b>		
Yes	394	61.37
No	248	38.63
<b>Health workers</b>		
Yes	576	89.72
No	66	10.28
<b>Social Media</b>		
Yes	298	46.42
No	344	53.58
<b>Radio</b>		
Yes	364	56.70
No	278	43.30
<b>Ministry of Health</b>		
Yes	570	88.79
No	72	11.21
<b>WHO</b>		
Yes	569	88.63
No	72	11.37
<b>Hotline Covid</b>		
Yes	545	84.89
No	97	15.11
<b>National Web of Covid</b>		
Yes	558	86.92
No	84	13.08
<b>Influencer</b>		
Yes	249	38.16
No	397	61.84
<b>Total</b>	<b>642</b>	<b>100</b>

**Table 3.** Distribution of respondents related to COVID-19 infection at Poltekkes Kemenkes Palu

Incidence of infection, vaccination, and type of vaccine	n	%
<b>Infected with COVID-19</b>		
Yes	117	18.2
No	525	81.8
<b>COVID-19 Vaccination</b>		
Yes	637	99.2
No	5	0.8
<b>Types of COVID-19 Vaccines</b>		
Vaccine 1	637	99.2
Vaccine 2	423	66.4
Boosters 1	265	41.6
Boosters 2	16	2.5
<b>Total</b>	<b>642</b>	<b>100</b>

The most significant dominant factor in implementing risk communication for preventing COVID-19 at the Poltekkes Kemenkes Palu is the behavior of wearing a mask and staying away from crowds. Never/rarely wearing a mask could increase the risk of being infected with COVID-19 2.3 times more than often/always wearing a mask (AOR: 2.3 95% CI 1.41-3.7). Never/rarely away from crowds could increase the risk of being infected with COVID-19 2.8 times more than often/always wearing a mask (AOR: 2.8 95% CI 1.6-5.1). The

age group of 40-60 years was the group most at risk of being infected with COVID-19 as much as 14.9 times compared to the age group <20 years (AOR: 14.9; 95% CI 5.7-39.0) (Table 7).

**Table 4.** Distribution of respondents who carry out the implementation of 5M risk communication for the prevention of COVID-19 at the Poltekkes Kemenkes Palu

Variable	n	%
<b>Washing Hands</b> Never/Rarely	290	45.17
Often/Always	352	54.83
<b>Wearing A Mask</b> Never/Rarely	311	48.44
Often/Always	331	51.56
<b>Keep The Distance</b> Never/Rarely	459	71.50
Often/Always	183	28.50
<b>Away From The Crowd</b> Never/Rarely	467	72.74
Often/Always	175	27.26
<b>Reduced Mobility</b> Never/Rarely	452	70.40
Often/Always	190	29.60
<b>Total</b>	<b>642</b>	<b>100</b>

**Table 5.** Cross-tabulation of the incidence of COVID-19 infection with the variables age, gender, education and employment status, location, history of chronic disease, and amount of expenditure at the Poltekkes Kemenkes Palu

Variable	History of COVID-19 infection				p-value
	No		Yes		
	n=525	%	n=117	%	
<b>Age</b>					
<20 y.o	374	89.90	42	10.10	
20-40 y.o	143	69.76	62	30.24	0.000
40-60 y.o	8	38.10	13	61.90	
<b>Gender</b>					
Male	79	78.22	22	21.78	0.313
Female	446	82.44	95	17.56	
<b>Status</b>					
Student	506	83.77	98	16.23	
Staff	8	47.06	9	52.94	0.000
Lecturer	11	52.38	10	47.62	
<b>Ethnic Group</b>					
Kaili	163	88.11	22	11.29	
Bugis	187	81.66	42	18.34	
Pamona	20	76.92	6	23.08	
Saluan	41	82.00	9	18.00	0.041
Jawa	46	76.67	14	23.33	
Gorontalo	43	79.63	11	20.37	
Others	25	65.79	22	11.89	
<b>Religion</b>					
Islam	458	81.49	104	18.51	
Christian	55	80.88	13	19.12	0.433
Catholic	3	100	0	0	
Hindu	9	100	0	0	
<b>Location</b>					
Palu	149	74.87	50	25.13	
Poso	75	74.26	26	25.74	0.000
Luwuk	72	87.80	10	12.20	
Toli-Toli	229	88.08	31	11.92	
<b>History of chronic disease</b>					
Yes	11	61.11	7	38.89	0.021
No	514	82.37	110	17.63	

Total Expenses					
≤ IDR 1,200,000	348	82.66	73	17.34	0.423
> IDR 1,200,000	177	80.09	44	19.91	

**Table 6.** Cross-tabulation between the history of COVID-19 infection and implementation of 5M risk communication for the prevention of COVID-19 at Poltekkes Kemenkes Palu

Behavior	History of COVID-19 infection				p-value
	No		Yes		
	n=525	%	n=117	%	
<b>Washing Hands</b>					
Never/Rarely	236	81.38	54	18.62	0.813
Often/Always	289	82.10	63	17.90	
<b>Wearing A Mask</b>					
Never/Rarely	243	78.14	68	21.86	0.021
Often/Always	282	85.20	49	14.80	
<b>Keep The Distance</b>					
Never/Rarely	367	79.96	92	20.04	0.059
Often/Always	158	86.34	25	13.66	
<b>Away From The Crowd</b>					
Never/Rarely	372	79.66	95	20.34	0.023
Often/Always	153	87.43	22	12.57	
<b>Reduced Mobility</b>					
Never/Rarely	359	79.42	93	20.58	0.017
Often/Always	166	87.37	24	12.63	

**Table 7.** Multivariate analysis of the history of being infected with COVID-19 with the implementation of 5M risk communication for the prevention of COVID-19 at the Poltekkes Kemenkes Palu

Variables	AOR	p-value	95% CI	
			Lower	Upper
<b>Age</b>				
<20 y.o	1.0			
20-40 y.o	3.4	<0.001	2.2	5.4
40-60 y.o	14.9	<0.001	5.7	39.0
<b>History of chronic disease</b>				
Yes	2.1	0.179	0.7	5.9
No	1.0			
<b>Wearing Masker</b>				
Never/Rarely	2.3	0.001	1.4	3.7
Often/Always	1.0			
<b>Away from the Crowd</b>				
Never/Rarely	2.8	<0.001	1.6	5.1
Often/Always	1.0			

#### 4. DISCUSSION

Designing communications to handle crises like COVID-19 requires a scientific approach with measurable steps to hit the target [13]. Communication is proven to have a positive impact that can increase one's motivation. Therefore, in terms of communication, someone needs accuracy, skill, and caution so that the motivation is under the expected goals. It is better if an individual equips himself with the skills of sending and receiving good information first rather than just going viral in cyberspace and thinking about the impact of the applied communication [15].

The most significant dominant factor in implementing COVID-19 prevention risk communication at the Poltekkes Kemenkes Palu, the most significant is the behavior of wearing a mask and staying away from crowds. Problems that

arise due to the pandemic include; first, there is no uniform understanding of the characteristics of the COVID-19 outbreak among the central and regional governments confusing information. Second, outreach was not carried out effectively; this can be seen in several cases of residents' rejection of the bodies of COVID-19 victims due to their lack of knowledge about this outbreak, which can potentially cause horizontal conflict. Third, even though the government has imposed Large-Scale Social Restrictions (PSBB), some are still active because they have to meet their daily needs. After all, it is doubtful that the promised compensation can guarantee to fulfill their daily needs [16].

One example of using virtual communication to prevent COVID-19 is using information and communication technology in the Halodoc application as a telemedicine check for COVID-19 to prevent the spread of the Coronavirus [17]. Chesser's research (2020) reported that when asked where students had heard about COVID-19, most reported it on the Internet and social media. Students reported a basic knowledge of COVID-19, but only a few students (18%) correctly identified the three signs and/or symptoms of COVID-19 [18]. Searches related to COVID-19 and face masks in Taiwan increased rapidly after the announcement of Taiwan's first imported case and peaked when locally acquired cases were reported. However, searches for hand washing have gradually increased during mask shortages [19].

Communication noise was identified in the process of handling COVID-19 in NTB. The noise is physical, technical, semantic, and psychological noise. Physical noise impacts people with disabilities because they receive less attention. Technical noise impacts distributing of aid and socializing during the COVID-19 outbreak. Semantic noise causes people to lack insight into the concepts used by the government. Psychological noise keeps people from following the government's appeal [20]. Jelahun [21] proposes that the government actively socialize and educate all matters related to COVID-19 information to avoid misunderstandings among the public.

In many countries, people have demonstrated good social discipline and continue to trust the government and the scientific advice they receive [22]. Social media culture in Indonesia can act as a teacher; it educates the public and stimulates the latest research related to COVID-19. It can be a public health service education; directing the public to their websites and landing pages for the latest and most reliable COVID-19 related information; marketing innovative services such as health care social fund services; posting related case information, photos, and results (with permission) related to COVID-19 to educate the public; sharing reviews and testimonies of recovered patients as motivation and early prevention efforts; and providing support between Indonesian citizens in dealing with the COVID-19 pandemic [23].

Research in China assessed the prevalence of psychological symptoms in college students and identified their association with health risk communication and social media. In addition to demographics, information on health risk communication and social media was collected, and a symptom checklist of 90 Phobia and health anxiety inventory subscales was used to assess psychological symptoms among 1676 college students in China and the results show that the prevalence of panic and health anxiety is 17.2% and 24.3%, respectively [24]. Regarding risk communication, understanding the risk of COVID-19 is a protective factor against panic [25]. Knowledge of prognosis, precautions, and use of face masks

was shown to be a protective factor in predicting health anxiety. Perception, influence by global spread, and impact on contact were identified as significant risk factors associated with health anxiety [24]. Regarding social media, reliance on mainstream media is considered a protective factor against health anxiety [26]. Health risk communication and social media use are important for predicting psychological symptoms, especially health anxiety.

## 5. CONCLUSIONS

In conclusion, this study highlights the importance of implementing COVID-19 prevention risk communication at the Poltekkes Kemenkes Palu. The behavior of wearing a mask and staying away from crowds were found to be the most significant factors in reducing the risk of COVID-19 infection. The age group of 40-60 years was identified as being the most at risk, and the research suggests that they should reduce crowds and always wear a mask.

However, this study has some limitations. Firstly, it was conducted in only one institution, which may limit the generalization of the findings to other settings. Secondly, the study was conducted using a cross-sectional design, which does not allow for the establishment of causal relationships between variables.

In future research, it would be beneficial to investigate the effectiveness of different risk communication strategies on COVID-19 prevention behaviors among various age groups and populations. Additionally, qualitative studies may provide deeper insights into the underlying reasons behind the observed behaviors and attitudes towards COVID-19 prevention measures. Finally, longitudinal studies could provide more robust evidence regarding the impact of risk communication interventions on the incidence and transmission of COVID-19.

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