

The Impact of Information Sources and Knowledge Transmission of Covid-19 on Community Prevention Behavior: A Cross-Sectional Study

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(Received: April 4, 2026 Revised: April 15, 2026 Accepted: April 16, 2026)

ABSTRACT

Introduction: The Coronavirus Disease 2019 (COVID-19) pandemic has been categorized as a global public health emergency with a rapid rate of transmission and geographical spread.

Objectives: This study aims to analyze the influence of information sources and knowledge on Covid-19 prevention and control behaviors.

Methods: The research method used a quantitative approach with a cross-sectional design. The study population consisted of patients who visited the Bergas Community Health Center in Semarang Regency Indonesia, with a sample of 136 respondents selected through purposive sampling. Data were collected using questionnaires and analyzed using descriptive methods and multiple logistic regression using the SPSS program.

Results: The results showed that the variables of information sources ($p=0.002$) and knowledge about Covid-19 transmission ($p=0.001$) had a significant effect on Covid-19 prevention and control behaviors. Knowledge about Covid-19 transmission is the most dominant determinant factor.

Conclusion: These findings confirm that public health practices depend not only on medical policies but also on the effectiveness of information communication, knowledge education, and the formation of sustainable preventive behaviors.

Keywords : COVID-19, Knowledge, Prevention Behaviour, Sources of Information

INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) pandemic has been categorized as a global public health emergency with a rapid rate of transmission and cross-border spread. According to the World Health Organization (WHO) and the Ministry of Health's Public Health Emergency Center, as of September 15, 2021, the global spread of Covid-19 across 204 countries has resulted in more than 225 million confirmed cases and 4,644,740 deaths. Meanwhile, the spread of Covid-19 in Indonesia has reached 4.178 million confirmed cases, including 3,953,519 recoveries and 139,682 deaths. COVID-19 is a contagious disease transmitted from person to person, either directly or indirectly, that attacks the respiratory tract (Chen et al., 2020). The average incubation period is 5–6 days, with the highest risk of transmission occurring in the early stages of the disease, even before symptoms appear (Du, 2020). This situation highlights the importance of public understanding of COVID-19 transmission in prevention efforts.

In dealing with the pandemic, sources of information play a major role in shaping public knowledge and attitudes. The World Health Organization (WHO, 2020) emphasizes the need for mitigation strategies tailored to local conditions, while governments in various countries have issued social distancing and physical distancing policies that have changed people's activities (Oe & Weeks, 2020). In Indonesia, all provinces have reported positive cases of Covid-19, making good surveillance one of the main pillars of response (BNPB, 2020). However, amid the abundance of information, there is still a lot of misinformation and disinformation that causes panic and rejection of official recommendations.

Changes in public behavior in preventing Covid-19 are crucial. Preventive measures such as coughing or sneezing etiquette, wearing masks, maintaining physical distance, and washing hands properly are best practices for suppressing the spread of the virus. Lockdowns in various countries (Lau et al., 2021) further emphasize the importance of public awareness in early detection, preventing delays in treatment, and reducing the risk of death. Research in Peru shows that although most people are aware of the incubation period of COVID-19, only half are able to correctly identify the symptoms (Ferdous et al., 2020). This confirms that public knowledge still needs to be improved.

Knowledge itself is the ability to receive, retain, and use information, which is influenced by formal and informal education, personal experience, environment, and mass media (Siltrakool et al., 2021). Having good knowledge will have a positive impact on behavioral aspects (Fitri et al., 2020). Research in China shows that people with good knowledge about Covid-19 tend to have optimistic attitudes and practice appropriate prevention measures (B. L. Zhong et al., 2020). Thus, increasing knowledge through accurate sources of information can encourage better preventive behavior. Based on these conditions, research on the determinants of preventive behavior and Covid-19 mitigation in Indonesia needs to be conducted. At the district level, there are variations in local conditions, including demographic, social, economic, and cultural differences, as well as health service capacity, which influence public knowledge about Covid-19 transmission and preventive behaviors. Districts with high population density, high mobility, and broad access to information face a higher risk of transmission than areas with small and limited populations. In addition, social norms, health literacy levels, and trust in information sources also determine the extent to which the community accepts and applies preventative practices, making district-level research important for understanding local determinants more accurately (Oe & Weeks, 2020).

The population of Semarang Regency in 2023 reached approximately 1.07 million, with 63.92% being of productive age (15–59 years) or around 689 thousand people (BPS, 2023). This condition makes COVID-19 prevention behavior critically important, as the high mobility of the productive group in work, education, and social activities increases the risk of virus transmission if health protocols are not followed. Therefore, consistent adherence to preventive measures such as mask-wearing, physical distancing, hand hygiene, and improved health literacy through credible information sources remains essential to protect this group while

maintaining social and economic stability in Semarang Regency. Accordingly, this study aims to analyze the relationships between sources of information, knowledge of COVID-19 transmission, and preventive behavior at the district level, as well as to identify key determinants influencing these behaviors, in order to inform targeted interventions for preventing future case surges and strengthening community resilience.

MATERIALS AND METHODS

This study used a quantitative method with a cross-sectional design. This approach was chosen because it can measure phenomena objectively through numbers, statistical data, and numerical analysis within a certain period. The study population consisted of all 155 patients who came to the Bergas Community Health Center in Semarang Regency. However, not all the population could be used as respondents, so a sample was selected based on inclusion criteria, namely respondents who came from the Bergas Community Health Center working area, were willing to complete the questionnaire, and provided informed consent. Selection using inclusion criteria was intended to ensure that the sample was relevant to the research objectives and that the respondents were fully willing to participate. Using purposive sampling techniques, 136 respondents who met the criteria were obtained.

The main data collection instrument was a questionnaire administered through face-to-face interviews. The questionnaire had been tested for validity and reliability and contained four main questions regarding willingness to seek medical attention when experiencing symptoms, attitudes toward contact history with patients, perceptions of the risk of gathering in public places, and willingness to self-isolate after traveling from a high-risk area. Respondents were asked to choose between disagree, agree, or strongly agree. Disagree responses were categorized as poor preventive behavior, while agree and strongly agree responses were considered good preventive behavior.

The questionnaire data were analyzed using descriptive statistics by calculating the mean, frequency, and percentage to provide an overview of the respondents' Covid-19 prevention and control behaviors. Furthermore, the analysis was conducted using Descriptive Analysis and Simple Regression Analysis methods using the SPSS (Statistical Packages for Social Sciences) program. Multivariate linear regression was used to identify the determinants of Covid-19 prevention and control behaviors, after first selecting variables based on Pearson correlation parameters above 0.40. This study has obtained ethical approval from the Research Ethics Committee of the Faculty of Dentistry, Sultan Agung Islamic University, with number: 355/B.I-KEPK/SA-FKG/II/2022.

RESULTS

Respondent Characteristics

Table 1. Frequency of Respondents Based on Characteristics

Characteristics	Frequency	Percentage
Gender		
Female	99	72.8
Male	37	27.2
Age		
Late Adolescence	60	44.1
Early adulthood	49	36.0
Late adulthood	18	13.2
Early elderly	9	6.6

Characteristics	Frequency	Percentage
Type of Work		
Not working	7	5.1
Male Driver	1	0.7
Teacher	2	1.5
Entrepreneur	12	8.8
Private employee	96	70.6
Others	18	13.3
Economic Status		
≤ Regional Minimum Wage	62	45.6
> Regional Minimum Wage	74	54.4
Level of Education		
Elementary	6	4.4
Junior High School	16	11.8
High School	98	72.1
Higher Education	16	11.8
Family History of COVID-19		
Yes	58	42.6
None	78	57.4
Sources of COVID-19 Information		
Social Media	89	65.4
Non-Social Media	47	34.6
Knowledge of Covid-19 Transmission		
Good	85	62.5
Poor	51	37.5
Social Activities During Covid-19 Illness		
High	101	74.3
Low	35	25.7
Covid-19 Prevention and Control Behavior		
Good	93	68.4
Poor	43	31.6

In Table 1, more than half of the participants were female (72.9%), one-third of the participants (44.1%) were early adolescents, employed in the private sector (70.6%), with an economic status above the regional minimum wage (54.4%), and the majority had a high school education (72.1%). Most participants had no family history of Covid-19 illness (57.4%), and no sources of Covid-19 information (57.4%). Most participants had good knowledge of COVID-19 transmission (62.5%), high levels of social activity when sick with COVID-19 (74.3%), and good COVID-19 prevention and control behaviors (62.5%).

Factors Associated with COVID-19 Prevention and Control Behavior

Table 2. Factors Associated with COVID-19 Prevention and Control Behaviors

Variable	COVID-19 Prevention and Control Behaviors		Number	P-Value
	Good	Poor		
Type of Work				
Not working	7	0	7	0.024
Driver	1	0	1	
Teacher	2	0	2	
Entrepreneur	1	2	12	
Private Employee	57	39	96	
Others	16	2	18	
Economic Status				
≤ Regional Minimum Wage	48	14	62	0.059
> Regional Minimum Wage	45	29	74	
Education Level				
Elementary	5	1	6	0.638
Junior High School	12	4	16	
High School	64	34	98	
Higher Education	12	4	16	
Elementary	5	1	6	0.638
Family History of Covid-19				
Yes	46	12	58	0.029
None	47	31	78	
Covid-19 Information Sources				
Social media	70	19	89	0.001
Not social media	23	24	47	
Knowledge of Covid-19 Transmission				
Good	79	6	85	0.000
Not Good	14	37	51	
Social Activities When Sick with Covid-19				
High	75	26	101	0.022
Low	18	17	35	

Table 2. Analyzing the variables studied and suspected to be related to Covid-19 prevention and control behaviors, including occupation (p-value 0.024), economic status (p-value 0.059), education level (p-value 0.638), family history of Covid-19 illness (p-value 0.029), source of information (p-value 0.001), knowledge about Covid-19 transmission (p-value 0.000), and social activities when sick (p-value 0.022).

Table 3. Multiple Logistic Regression Analysis

Variable	B	Wald	P-Value
Source of COVID-19 Information	2,368	8,728	0.002
Knowledge of Covid-19 Transmission	4,424	29,120	0.001
Constant	-12,019		

Table 3. The variables that are significant for Covid-19 prevention and control behavior are the information source variable (0.002) and knowledge about Covid-19 transmission (p-value 0.001). The variable of knowledge about Covid-19 transmission is the most dominant variable in Covid-19 prevention and control behavior.

DISCUSSION

Multivariate logistic regression highlights knowledge of Covid-19 transmission as the strongest independent predictor of Covid-19 prevention and control behavior (4.424). Other factors such as Covid-19 prevention and control behaviors, including occupation (p-value 0.024), family history of Covid-19 illness (p-value 0.029), information sources (p-value 0.001), and social activities while sick (p-value 0.022) remain statistically significant. These results underscore that the determinants of COVID-19 Prevention and Control Behavior are multifactorial and interrelated.

Social Factors Significantly Associated with COVID-19 Prevention and Control Behavior

The type of work is related to community independence in preventing Covid-19, where private sector workers are more independent in implementing health protocols. The work environment serves as a social interaction arena that enriches knowledge, while cognitive skills encourage awareness of occupational health and safety. Company policies such as the provision of hand sanitizers, masks, and hand-washing facilities have been proven to form new habits oriented towards preventing transmission. These findings are in line with the Indonesian Ministry of Health's 4th revision of the Covid-19 Prevention and Control Guidelines, which emphasizes the workplace as a strategic location for the implementation of health protocols (Indonesian Cabinet Secretary, n.d.). Research by (Nguyen et al., 2022) shows that formal sector workers are more compliant due to strict company regulations, while (Chang et al., 2021) asserts that workplace health facilities increase worker knowledge and compliance. Recommendations from the ILO, WHO, and UNDP (2020) also emphasize the importance of risk-based protocols, good ventilation, and consistent risk communication in the workplace. Formal sector workers are more structured in their compliance due to regulations and facilities, while the informal sector faces limitations. This study reinforces the view that the workplace is a strategic arena in pandemic mitigation.

The results of this study also highlight that education and employment are not directly related to Covid-19 prevention behavior, although both still play an important role in increasing knowledge and access to health facilities. The higher a person's academic background, the better their knowledge of

Covid-19, thereby increasing compliance with health protocols. The study by (McCaffery et al., 2020) states that a higher level of education predicts comprehensive knowledge about Covid-19 prevention and control measures. This study confirms that the main influence on Covid-19 prevention behavior comes through knowledge about Covid-19 transmission.

Individuals who have family members who have been infected tend to be more vigilant and compliant with health protocols. This can be explained through health theory, where direct experience or proximity to disease cases increases risk perception and encourages preventive behavioral changes. (Indraswari et al., 2022) emphasize that families of Covid-19 patients must have the right knowledge and attitudes to prevent further transmission, as interaction with patients makes family members more aware of the importance of preventive measures such as wearing masks and washing hands. Additionally, (Saroh & Gunardi, 2023) show that family support is closely related to preventive behavior, especially in vulnerable groups such as the elderly. Family knowledge and attitudes have been shown to influence compliance with health protocols, so that the higher the family's knowledge, the better the preventive behavior. Thus, family experiences with COVID-19 are an important factor in shaping awareness and compliance with health protocols. Families who have experienced COVID-19 cases are more active in reminding and supporting the implementation of preventive behaviors, thereby reducing the risk of transmission.

The Impact of Information Sources and Knowledge Transmission of Covid-19 on Community Prevention Behavior

Individuals who frequently access information from official sources, including credible social media, are more compliant with health protocols such as wearing masks, maintaining physical distance, washing hands, and avoiding crowds. Conversely, low access to information reduces the level of independence in prevention. Previous studies support these findings. (Wang et al., 2021) and (Wong et al., 2020) showed that health literacy has a positive effect on the implementation of preventive measures. (Zhang et al., 2024) confirmed that searching for information related to COVID-19 increases protective behavior in the community. However, false information on the internet can cause panic and reduce compliance (Mourad et al., 2020). Another study by (Xue et al., 2022) emphasizes that official information sources from the government and health workers increase compliance, while information that is not credible reduces it. In line with this, the MDPI report (2021) and research by (Uchibori et al., 2022) show that people who obtain information from official media have higher knowledge and are more active in taking preventive measures. In the long term, improving public health literacy is an urgent need (Shaker et al., 2020). This study confirms that accurate information and public health literacy are important determinants in the success of pandemic prevention efforts.

Knowledge about Covid-19 transmission has a positive and significant effect on independence in prevention. The higher the level of public knowledge, the better their independence in carrying out prevention, while low knowledge is associated with low compliance. This is in line with (B.-L. Zhong, 2020) research in China, which found a relationship between knowledge and attitudes towards Covid-19 transmission prevention behaviors (OR: 0.75, $p < 0.001$). From a social psychology perspective, attitudes are closely related to a person's level of knowledge, where knowledge forms the basis for attitudes and actions. Other studies support these findings. (Djami et al., 2013) showed a significant relationship between knowledge and attitudes ($p = 0.000$) and individual actions ($p = 0.000$). (Rizma S & M, 2020) emphasized that providing specific and valid knowledge can improve preventive behavior among Indonesians. In line with the Knowledge, Attitude, and Practice (KAP) model, knowledge is one

of the main domains that influence health behavior. Other studies also reinforce this, such as those by (Andarge et al., 2020); (Angelo, A.T. et al., 2021); (Chen, Liu, et al., 2020); (Devkota et al., 2021); (Endriyas et al., 2021); (Gebretsadik et al., 2021); (Papagiannis et al., 2020); (Tien et al., 2021), which consistently show that knowledge influences Covid-19 prevention behavior. In addition, virology research supports the importance of knowledge about transmission mechanisms. (Wolfel, 2020) found that SARS-CoV-2 replicates actively in the upper respiratory tract, making it more transmissible than SARS-CoV. Rothe et al. (2020) reported that individuals with mild symptoms still have a high viral load in their throats, so droplet transmission through coughing or sneezing occurs very quickly. Knowledge is a key determinant of COVID-19 prevention behavior. This study confirms that accurate knowledge about COVID-19 is an important foundation in shaping public attitudes and preventive actions against the pandemic.

Individuals who continue to engage in social activities despite being sick are at higher risk of transmitting Covid-19, making compliance with health protocols very important. A longitudinal study by (Perez-Brumer et al., 2022) highlights that changes in social interactions during the pandemic not only have an impact on psychosocial health but are also related to compliance with preventive behaviors. People who limit their social activities when sick are better able to protect themselves and their environment from transmission. Other studies support these findings. (Choi & Noh, 2023) found that social norms play an important role in encouraging preventive behaviors. Individuals who continue to socialize when sick tend to be influenced by group norms that are less supportive of health protocols, thereby reducing their compliance. Conversely, social norms that emphasize preventive significantly increase compliance. A study by (Fenta et al., 2024) also confirms that social activities, including interactions via social media, can influence preventive behavior. Healthy interactions based on medical information encourage compliance, while interactions that ignore health conditions increase the risk of transmission. Thus, this research confirms that controlling social activities and strengthening preventive norms are important strategies in curbing the spread of COVID-19.

Knowledge about Covid-19 transmission is the most dominant factor in shaping community independence in prevention. The higher the community's understanding of how the virus is transmitted, the more likely they are to implement correct preventive behaviors, such as wearing masks, maintaining physical distance, and reducing mobility. These findings are in line with research in Indonesia by (Sherina Ramadhan, Rize Budi Amalia, 2023), which emphasizes that predisposing factors such as community knowledge and attitudes greatly determine compliance with health protocols. Consistent results are also seen in the study by (Rakotomanana et al., 2020), which shows that access to accurate information increases risk awareness and compliance, while misinformation reduces preventive behavior. Additionally, other variables such as occupation, economic status, family history of COVID-19, and social activities while sick are indeed related to preventive behavior, but not as strongly as knowledge and information sources. Thus, this study confirms that knowledge about how COVID-19 is transmitted is the main determinant in shaping preventive behavior among the public, as well as an important foundation for health education strategies during the pandemic.

In the post-COVID-19 pandemic era, control efforts will depend on active community participation through surveillance, early detection, and compliance with health protocols. Improving public knowledge, attitudes, and awareness is key to success because asymptomatic cases add to the complexity of transmission. Although many asymptomatic cases recover on their own, they remain potentially infectious, so prevention strategies must emphasize transmission education, proactive detection, and accurate risk communication. Previous research supports this view: some asymptomatic

individuals may develop symptoms during isolation (Hu & Song, 2020), the incubation period allows for pre-symptomatic transmission (Gao et al., 2020), and viral load in asymptomatic cases can be similar to symptomatic cases, making them potentially infectious (Minzhe Shen & Zou, 2020), but high viral load does not always indicate infectious virus (Wolfel, 2020), and patients who test positive again via nucleic acid testing do not always cause new infections (An, 2020).

CONCLUSIONS

In conclusion, this study confirms that accurate knowledge about Covid-19 transmission, including asymptomatic cases, is the main foundation of pandemic control strategies that involve active community participation. This shows that public health practices do not only depend on medical policies, but also on information communication, knowledge education, and the formation of sustainable preventive behaviors. The implications of this study extend to strengthening community resilience for future pandemics. Credible information, accurate knowledge, and consistent preventive behaviors enhance adaptive capacity and preparedness. Collaboration between local governments, health workers, and communities fosters collective efficacy, while sustained health communication and trust-building initiatives support long-term resilience and effective crisis response.

Acknowledgement

This research was funded by the Education Fund Management Institution of the Ministry of Finance of the Republic of Indonesia (LPDP RI). We would like to thank Ngudi Waluyo University for facilitating the research activities, as well as the Bergas Community Health Center in Semarang Regency, Central Java Province, as a cooperation partner, and the community who willingly participated as respondents in the research activities.

Funding Source

Funding number: 152/E4.1/AK.04.RA/2021

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