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Original Research Article

The Relationship of Knowledge Level with Community Behaviour in the Swiss Cheese Prevention Efforts Model of Covid-19 Transmission During New Normal Era in Surabaya

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ABSTRACT

The number of confirmed cases of COVID-19 slowly decreasing from the efforts of health workers, the public, and the government in breaking the COVID-19 chain. But in June 2021, the number of COVID-19 cases increased again. This study aims to determine the relationship between the level of knowledge and community behavior to prevent the Swiss cheese model of COVID-19 transmission in the new normal period in Surabaya. The design of the study was cross-sectional. The study used primary data by distributing questionnaires to 101 respondents in five areas of Surabaya, namely Central Surabaya, North Surabaya, East Surabaya, South Surabaya, and West Surabaya. The data were then processed and analyzed univariately presenting the frequency distribution and bivariate using Spearman rank correlation through SPSS. The results of the analysis showed that the level of knowledge of the people of Surabaya was in the high category (66.3%) and preventive behavior was in a good category (84.2%). The results of the Spearman rank correlation study were obtained p value = 0.037 ($p<0.05$). There is a significant relationship between the level of knowledge and community behavior in the effort to prevent Swiss Cheese Model COVID-19 transmission in the new normal era in Surabaya.

Keywords: COVID-19, Knowledge, Behavior, Prevention.

Introduction

COVID-19 was first discovered in late 2019 in Wuhan, China.[1] COVID-19 is an RNA virus that belongs to the same group as the coronavirus, with the main transmission being through droplet contact of infected patients.[2]. COVID-19 attacks the respiratory system and causes acute respiratory distress with some of the signs and symptoms, namely fever and respiratory disease (such as coughing and shortness of breath) and several other organs.[3] On February 11, 2020, this virus claimed many lives from various countries, so the WHO declared that COVID-19 had entered a pandemic status. The number calculated globally according to WHO (2020), namely at the end of November 2020, there were 57,882,183 confirmed cases of COVID-19 including 1,337,395 deaths and in Southeast Asia, there were also 10,421,539 confirmed cases with 159,263 deaths. The total number of confirmed cases in Indonesia according to the statistical data of the national COVID-19 Handling Task Force (2020) is 497,668 with 15,884 deaths. Confirmed cases in East Java according to the statistical data of the East Java COVID-19 Task Force (2020) totaled 58,679 and 4,149 died. The total number of confirmed cases of COVID-19 in Surabaya, according to the statistical data of the Surabaya COVID-19 Task Force (2020), amounted to 16,620 and 1,199 died. To prevent a wider spread, on March 31, 2020, the Indonesian government established Large-Scale Social Restrictions (PSBB) in each region and formed a Task Force for the Acceleration of Handling COVID-19.[4]

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PSBB was enforced in all regions in Indonesia, including East Java Province. The Governor of East Java also issued PSBB guidelines for handling Covid-29 in East Java including the City of Surabaya on April 22, 2020.[5] PSBB is carried out in one way, namely preventing gatherings such as restrictions on workplaces. Long-term PSBB can affect the economy so the government takes mitigation by making adaptations through lifestyle changes in the COVID-19 situation or what is called the new normal. The new normal is a form of action to minimize the impact on society due to the COVID-19 pandemic.[6] The Indonesian government's appeal to carry out social distancing in the community to reduce mortality is very dependent on the individual understanding of each community.[7] Successful prevention of the spread of disease depends on a compliant society.[8]. In addition to individual responsibility, there is a need for shared responsibility in carrying out preventive behavior following the Swiss Cheese Model strategy. The Swiss Cheese Model is a visualization of each prevention effort to reduce the spread of COVID-19, where every prevention effort has its weaknesses. Carrying out various preventive behaviors such as health protocols can cover up. Another study states that the attitude of some teenagers in Surabaya still admits that sometimes they wear masks.[9] Age, education level, type of work, and socioeconomic factors cannot influence the behavior of preventing the spread of COVID-19. While the knowledge factor can affect the behavior of preventing the transmission of COVID-19.[10] Statistical data from the Surabaya COVID-19 Task Force (2020), it was found that Surabaya again experienced an increase in COVID-19 infections in early June, it was found that 131 people confirmed in treatment until early July amounted to 652 patients and a total of 1402 patients died. The increase in COVID-19 infections in Indonesia has made the government make a policy in the form of PPKM or the Enforcement of Restrictions on Community Activities as a form of follow-up to the president's directives following the criteria for the level of the COVID-19 pandemic situation.[11] A similar study was conducted in Turkey by Uzuntarla and Ceyhan,[12] which found that there was a significant relationship between knowledge, attitudes, and behavior toward

COVID-19 in health workers.[12] Mujiburrahman *et al*.[13] also conducted a similar study using the Spearman test analysis on respondents taken from the community in the Potorono Banguntapan Hamlet, Bantul D.I. Yogyakarta and it was found that there was a relationship between knowledge and COVID-19 prevention behavior, a p-value = 0.001 (p <0.05).[13] A similar study by Susanti and Sri,[14] found a significant relationship between the knowledge of DIII Midwifery students at the Mohammad Husni Thamrin University and the behavior of preventing the COVID-19 virus (p-value = 0.024)[14]

Based on the description above, even though the PSBB has been implemented, in fact it is still not optimal in reducing the death rate and making residents in Surabaya still have confirmed COVID-19. So the need for the role and participation of the community in implementing policies from the government. A good application of knowledge about COVID-19 and also in taking precautions to reduce virus transmission. From the things that have been mentioned, researchers are interested in researching the relationship between knowledge level and community prevention behavior to prevent the Swiss cheese transmission model of COVID-19 in the new normal period in the city of Surabaya.

Materials and Methods

The research method is quantitative. The design of this study is descriptive in nature to determine the relationship between the level of knowledge and community prevention behavior in dealing with the new normal of the COVID-19 pandemic using a cross-sectional method with each subject being examined only once. A total of 2,362,910 Surabaya residents lived in Central Surabaya. North Surabaya, East Surabaya. South Surabaya. And West Surabaya was included in this study. The study's sample consisted of Surabaya residents who met the following criteria: Inclusion criteria: Male and female must be between the ages of 15 and 69 with last education from elementary to doctoral and be willing to participate in the research. Exclusion criteria: Residents who do not have a Surabaya ID card or who do not live in Surabaya are excluded. In this study, the sample size is determined using the Lemeshow formula.

$$n = \frac{N.Z^2_{1-\frac{\alpha}{2}}.p.q}{d^2.(N-1)+Z^2_{1-\frac{\alpha}{2}}.p.q}$$

Note:
n : Sample size
N : Total population
q : 1 – p
$Z_{1-\alpha_2}$: Z Statistics (Z = 1,96 for α = 0,05
d : Absolute precision data or margin of error used
p : Approximate proportion

The research material used in this study is primary data obtained from a questionnaire totaling 34 statements, 15 of which represent the level of knowledge and 19 of which represent preventive behavior. The questionnaire includes 25 favorable statements and 9 unfavorable statements. The validity and reliability of the questionnaires that were distributed have been tested, and they were distributed to the selected samples based on the study's inclusion and exclusion criteria. The data obtained were collected and processed and then analyzed for univariate data and bivariate analysis using the Spearman ranking correlation through the SPSS program to test the relationship with the variables.

Table 1: Questionnaire favorable and unfavorable

Aspect	Favorable	Unfavorable	Total
Knowledge Level	7 (1,3,4,6,8,12,15)	8 (2,5,7,9,10,11,13,14)	15
Preventive Behavior	18 (1,2,3,4,5,6,7,8,9,11,12, 13,14,15,16,17,18,19)	1 (10)	19
Total	25	9	34

Results and Discussion

COVID-19 entered Surabaya City on March 23, 2020, and the number of positive verified cases has escalated since then, with a total of 65,470 confirmed COVID-19 cases in the City of Surabaya as of early September 2021. After gathering the information, the characteristics of the respondents were determined based on the community's knowledge and behavior, and they are shown in tables 1 and 2. According to Table 2, respondents with a high degree of knowledge are aged 21-30 years (80%), male (66.7%), last education S2 (75%), and not COVID-19 survivors (70.1%).

Table 2: Characteristics of Respondents Based on Knowledge Level

			Knowledge Level		Total
			High	Moderate	
Age	15-20	n	6	7	13
		%	46.2	53.8	100.0
	21-30	n	24	6	30
		%	80.0	20.0	100.0
	31-40	n	4	3	7
		%	57.1	42.9	100.0
	41-50	n	19	12	31
		%	61.3	38.7	100.0
	51-60	n	13	6	19
		%	68.4	31.6	100.0
	61-69	n	1	0	1
		%	100.0	0.0	100.0
Gender	Man	n	18	9	27
		%	66.7	33.3	100.0
	Woman	n	49	25	74
		%	66.2	33.8	100.0
Last Education	Junior Highschool	n	2	0	2
		%	100.0	0.0	100.0
	Senior Highschool	n	16	13	29
		%	55.2	44.8	100.0
	D1/D2/D3	n	7	3	10
		%	70.0	30.0	100.0
	D4/S1	n	39	17	56
		%	69.6	30.4	100.0
	S2	n	3	1	4
		%	75.0	25.0	100.0
Job	Student	n	23	12	35
		%	65.7	34.3	100.0
	IRT	n	13	8	21
		%	61.9	38.1	100.0
	Self-employed	n	8	4	12
		%	66.7	33.3	100.0
	Private Employees	n	14	6	20
		%	70.0	30.0	100.0
	Government Employees	n	4	3	7
		%	57.1	42.9	100.0
	BUMN/BUMD	n	5	1	6
		%	83.3	16.7	100.0
COVID-19 Survivor	COVID-19 Survivor	n	20	14	34
		%	58.8	41.2	100.0
	Not COVID-19 Survivor	n	47	20	67
		%	70.1	29.9	100.0

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Table 3 shows that respondents who have good preventive behaviour according to their characteristics are aged 31-40 years (100%), female (90.5%), last education S2 (100%), and COVID-19 survivors (88, 2%).

Table 3: Characteristics of Respondents Based on Community Behaviour Variables.

			Community Behavior		Total
			Good	Moderate	
Age	15-20	n	9	4	13
		%	69.2	30.8	100.0
	21-30	n	24	6	30
		%	80.0	20.0	100.0
	31-40	n	7	0	7
		%	100.0	0.0	100.0
	41-50	n	27	4	31
		%	87.1	12.9	100.0
	51-60	n	17	2	19
		%	89.5	10.5	100.0
	61-69	n	1	0	1
		%	100.0	0.0	100.0
Gender	Man	n	18	9	27
		%	66.7	33.3	100.0
	Woman	n	67	7	74
		%	90.5	9.5	100.0
Last Education	Junior Highschool	n	2	0	2
		%	100.0	0.0	100.0
	Senior Highschool	n	21	8	29
		%	72.4	27.6	100.0
	D1/D2/D3	n	7	3	10
		%	70.0	30.0	100.0
	D4/S1	n	51	5	56
		%	91.1	8.9	100.0
	S2	n	4	0	4
		%	100.0	0.0	100.0
Job	IRT	n	28	7	35
		%	80.0	20.0	100.0
	Self-employed	n	18	3	21
		%	85.7	14.3	100.0
	Private Employees	n	11	1	12
		%	91.7	8.3	100.0
	Government Employees	n	15	5	20
		%	75.0	25.0	100.0
	BUMN/BUMD	n	7	0	7
		%	100.0	0.0	100.0
		n	6	0	6
COVID-19 Survivor	COVID-19 Survivor	n	30	4	34
		%	88.2	11.8	100.0
	Not COVID-19 Survivor	n	55	12	67
		%	82.1	17.9	100.0

Relationship between Community Behavior and Knowledge Level

Table 4 shows the distribution of respondents based on their level of knowledge and community behavior. It reveals that the majority of respondents (89.6%) have a high degree of knowledge and strong preventive practice.

Table 4: Cross Tabulation of All Respondents Based on Knowledge Level and Prevention Behavior in Surabaya City

			Preventive Behavior		Total
			Good	Moderate	
Level of Knowledge	High	n	60	7	67
		%	89.6	10.4	100.0
	Moderate	n	25	9	34
		%	73.5	26.5	100.0
Total		n	85	16	101
		%	84.2	15.8	100.0

Table 5: The Relationship between Knowledge Level and Community Behaviour in Prevention Efforts of Swiss Cheese Model of COVID-19 Transmission in the New Normal Period in the City of Surabaya

			Community Behavior	Description
Spearman's rho	Level of Knowledge	r	0.207	Weak positive correlation coefficient
		P	0.037 (<0.05)	There is a relationship between the level of knowledge with people's behaviour
		N	101	The number of samples is 101 respondents

As many as 10.4% of respondents have a high degree of knowledge and sufficient preventive behavior. The majority of responders (73.5%) have a moderate degree of understanding and practice excellent preventive behavior. As many as 26.5% of respondents had a moderate degree of knowledge and adequate preventative behavior. The Spearman rank correlation was used in the study analysis test to assess the relationship between the level of knowledge and the conduct of the community to prevent the Swiss cheese transmission model of COVID-19 in the new normal period in the city of Surabaya.

Table 5 shows that the correlation coefficient is 0.207 which is between the interval $0 < r < 0.5$ which is interpreted as there is a weak positive relationship between the variables and it is obtained $0.037 > 0.05$ which means that there is a significant relationship between the level of knowledge and community behaviour in Swiss prevention efforts. Cheese The model of COVID-19 transmission in the new normal period in the city of Surabaya.

Conclusion

Based on the findings, it was concluded as follows: The inhabitants of Surabaya know 66.3% of the facts and information related to the COVID-19 disease. These include signs and symptoms, risk factors, and how the disease is transmitted. Surabaya residents have strong habits of safe behavior (84.2%). For example, they wear protective masks, stay sheltered at home, take care of their personal hygiene and avoid getting close to people. Additionally, they regularly test and trace their infections as a preventive measure. There is a significant association between the knowledge level of the community and their cooperation in preventing the Swiss cheese model of COVID-19 in Surabaya. The value of this relationship is 0.037, which resulted in a weakly positive correlation with a value of 0.207.

Conflict of Interest

The authors declare no conflict of interest.

Authors' Declaration

The authors hereby declare that the work presented in this article is original and that any liability for claims relating to the content of this article will be borne by them.

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