Knowledge Level of COVID-19 Prevention in Banjar Gambang Communities, Seraya Village, Karangasem, Indonesia

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Abstract

Background: Problems to COVID-19 are closely related to the level of knowledge and community prevention. Therefore, to overcome COVID-19, increased knowledge and prevention are needed. This study aimed to evaluate the correlation between prevention and knowledge level about COVID-19.

Methods: A cross-sectional study using a convenience sampling approach was conducted in Banjar Gambang, Karangasem, Indonesia, in April 2022. The knowledge level and preventive behavior towards COVID-19 were measured using the COVID-19 Preventive Behaviors Index (CPBI) and the knowledge, attitudes, and practice toward COVID-19 (KAPCOV-19) questionnaire. The data were analyzed using SPSS software version 26.0.

Results: A total of 52 respondents were included, who had excellent level of knowledge (44.2%) and moderate prevention behaviour (48.1%). A strong and significant correlation was found between the preventive index and the knowledge levels of COVID-19 ($r=0.548$; $p<0.001$). The level of knowledge was significantly related to the level of preventive behavior ($p=0.003$), as well as the education level ($r=0.323$; $p=0.02$) and age ($r=-0.346$; $p=0.012$).

Conclusion: The level of knowledge and the individual prevention behavior toward COVID-19 are directly proportional to each other. Those who have a low level of knowledge, might affect their prevention behavior toward COVID-19, therefore, personalized socialization of COVID-19 prevention is still required.

Keywords: COVID-19, KAPCOV-19, knowledge, preventive behaviors index

Introduction

Coronavirus disease 2019 (COVID-19) continues to increase in transmission. A serious threat to public health has been caused by the pandemic brought on by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[1] Around 440 million people worldwide have been confirmed positive for COVID-19. Each person experiences different symptoms, but common symptoms are cough, fever, loss of taste or smell, headache, difficulty breathing, fatigue, muscle aches, runny nose, sore throat, diarrhea, nausea, and vomiting.[2]

The SARS-CoV-2 virus has the ability to adapt to its host due to its high mutation rate, so the virus can evolve rapidly.[3,4] This event is evident from the change in the COVID-19 disease from a pandemic to an endemic. One of the mutations experienced is point mutations that can randomly create different strains in each region and develop a unique characteristic, which will then produce the effects of the virus and how the virus interacts with humans.[5] In order to prevent COVID-19 transmission, the health protocol guidelines have been made by the World Health Organization (WHO).[6] In Indonesia, there are new regulations related to quarantine, self-isolation, integrated isolation, lockdown, and large-scale social restrictions (*Pembatasan sosial berskala besar*, PSBB).[7] However, the success of this strategy depends on several factors, in particular the support and compliance of the community in

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 https://doi.org/10.15850/amj.v10n2.2857

following government prevention guidelines.[8] In several studies that have been carried out, it has been found that women and people with higher levels of education tend to have a higher level of compliance with health protocol guidelines made by the government.[9] Likewise with people who perceive the virus as a serious threat and people who trust health institutions.[10] According to the 2021 COVID-19 Task Force report, public compliance with health protocols is assessed from the behavior of wearing masks, maintaining distance and avoiding crowds (3M), admonishing or reminding 3M, and institutional compliance. On the zoning map of community compliance in maintaining distance and avoiding crowds, it is known that eastern Bali has community compliance of 79–90%, while other areas of Bali have 91–100% compliance.[11] Karangasem is one of the regencies located in the eastern part of the island of Bali. Although Karangasem is in the second lowest rank of the total positive confirmed cases in Bali, the case fatality rate (CFR) in Karangasem occupies the highest position at 7.43%, even exceeding Denpasar City which is the capital of Bali Province.[12] In addition, Karangasem Regency also occupies the bottom two positions in terms of first, second, and third doses of vaccination.[13]

To prevent wider transmission of the virus, good knowledge and understanding from the community are needed.[14] This knowledge is not only limited to how to prevent it, but also an understanding of the disease, modes of transmission, treatment methods, and the complications that may occur.[15] This study aimed to find out about the correlation of knowledge level and the prevention of COVID-19, especially in the community of Banjar Gambang, Seraya Village, Karangasem, Bali, Indonesia.

Methods

A descriptive-analytical method and a cross-sectional method were used. This study was conducted in Banjar Gambang, Seraya Village, Karangasem, Bali, Indonesia on April 24, 2022, and has been ethically approved by Faculty of Medicine, Udayana University with ethical number [2022.01.1.0460]. The inclusion criteria were the people of Banjar Gambang, Seraya Village, Karangasem aged 17–80 years, were willing to participate in the study, and answered the questionnaire completely. Filling out the questionnaire was assisted by the surveyor who would explain each item in communicatively but still in line with the subject matter. Meanwhile, the exclusion criteria were, participants suffering from COVID-19 at the time of data collection. A total of 52 people were involved in this study. The sample size was determined based on the Arikunto method.[16] Data collection was carried out by interviewing at community halls and from house to house in order to obtain primary data.

The questionnaires used included questionnaires on respondent characteristics such as gender, age, education level, education, COVID-19 information source, COVID-19 infection history, and the COVID-19 vaccination history), knowledge, attitude, and practice toward COVID-19 (KAPCOV-19), and the COVID-19 Preventive Behaviors Index (CPBI).[17,18] The KAPCOV-19 questionnaire, in particular, the knowledge section was used. This questionnaire included 12 items of knowledge level questions with 9 favorable items (statements that support or side with the research object) and 3 non-favorable items that could be answered with (true, false, and do not know). The correct answer will get a 1 score while the wrong or don't know the answer will get a 0 score. The final score was calculated and categorized into excellence (score 9–12), moderate (score 4–8), and poor (score 0–3) knowledge. This questionnaire had a Cronbach's alpha of 0.71 for reliability.

Determination of the level of preventive action was carried out using the CPBMI questionnaire which has been adjusted to the Regulation of the Indonesian Health Minister (HK.01.07/MENKES/413/2020) to assess COVID-19 preventive measures which consisted of 10 questionnaire items (8 favorable questions and 2 non-favorable questions) with a score range between 1 to 5 for each item. The final score was calculated and categorized into excellence (score 41–50), moderate (score 21–40), and poor (score 10–20) behavior index. This questionnaire had a Cronbach's alpha of 0.75 for reliability. The characteristics of each variable were conducted using univariate analysis to describe and also to explain the data. Besides, to determine the relationship and correlation between variables, a bivariate analysis using the Pearson Correlation Test (with Spearmen's test as an alternative) was conducted.

Results

Of the 52 respondents, the majority of respondents were male (n=29; 56%), were in the age range of 29–49 years (n=24; 46%) and

had an education equivalent to elementary school (n=19; 36%) (Table 1). Most of the respondents were farmers (n=13; 25%). Information about COVID-19 was mostly obtained from the mass media (n= 23; 44%). From all respondents, there was 1 person (2%) who was confirmed positive for COVID-19. The history of COVID-19 vaccination in respondents shows that there were 2 respondents (3%) who had not received the COVID-19 vaccine, 3 respondents (6%) who had just received the first dose of vaccine, as many as 13 people (25%) had just received the second dose of vaccine, 34 respondents (65%) had received the third dose of vaccine.

Measuring the knowledge level and the COVID-19 prevention index showed that the average scores of participants were 38.79±6.18

Table 1 Characteristics of Respondents

Characteristic	n (%)	Knowledge Score		Prevention Score	
		Mean Score ± SD	p	Mean Score ± SD	p
Gender			0.569		**0.012***
Male	29 (56)	8.55±2.37		36.90±6.37	
Female	23(44)	9.00±1.98		41.17±5.10	
Age (year)			**0.015***		0.534
<29	6 (12)	9.83±1.33		40.00±9.32	
29–49	24 (46)	9.50±1.47		39.50±5.39	
50–80	22 (42)	7.63±2.57		37.68±6.15	
Education			**0.028***		0.180
Unschooled	9 (17)	7.11±2.26		34.89±5.95	
Primary school	19 (36)	8.53±2.50		40.21±5.08	
Middle school	6 (12)	9.67±1.50		40.17±6.43	
High school	15 (29)	9.87±1.13		39.53±7.14	
Graduation and above	3 (6)	7.67±2.31		35.00±4.39	
Occupation			0.105		0.215
Farmer	13 (25)	7.46±2.44		35.92±5.76	
Unemployed	11 (21)	8.55±2.81		37.73±7.09	
Seller	7 (13)	9.43±1.81		41.29±7.16	
Labor	5 (10)	10.00±0.71		41.60±2.41	
Others	16 (31)	9.25±1.57		39.87±5.75	
Sources of information			**0.003***		0.133
Family	11 (21)	8.27±2.33		37.82±6.16	
Public health service	5 (10)	10.20±1.10		41.40±6.43	
Mass media	23 (44)	9.26±1.51		39.52±5.87	
Social media	2 (3)	10.50±.71		44.00±2.83	
Other	5 (10)	9.80±1.30		39.80±5.54	
Never	6 (12)	5.00±1.67		33.00±6.23	
Diagnostic history of COVID-19 infection					
Yes	1 (2)	11		47	
No	51 (98)	8.71±2.19		38.63±6.13	
COVID-19 vaccination history			0.302		0.463
Not vaccinated	2 (3)	8.50±2.12		40.00±8.49	
First dose	3 (6)	7.00±1.00		33.33±4.04	
Second dose	13 (25)	9.31±1.70		38.61±6.16	
Third dose	34 (66)	8.71±2.41		39.26±6.24	
Total		8.75±2.20		38.79±6.18	

Table 2 Knowledge about COVID-19 in Banjar Gambang Communities, Seraya Village, Karangasem, Indonesia

Items of Questionnaire	Responses		
	True n (%)	False n (%)	I don't know n (%)
The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia	**40 (77)**	11 (21)	1 (2)
Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus.	17 (32)	**34 (66)**	1 (2)
There currently is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection.	**28 (54)**	23 (44)	1 (2)
Not all persons with COVID-2019 will develop into severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases.	**45 (87)**	7 (13)	0 (0.0)
Eating or contacting wild animals would result in the infection by the COVID-19 virus.	14 (27)	**37 (71)**	1 (2)
Persons with COVID-2019 cannot infect the virus others when a fever is not present.	**28 (54)**	23 (44)	1 (2)
The COVID-19 virus spreads via the respiratory droplets of infected individuals.	**43 (83)**	8 (15)	1 (2)
Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus	**51 (98)**	1 (2)	0 (0.0)
Children and young adults don't need to take measures to prevent the infection by the COVID-19 virus	12 (23)	**40 (77)**	0 (0.0)
To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportations	**47 (90)**	5 (10)	0 (0.0)
Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus	**46 (88)**	5 (10)	1 (2)
People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days	**43 (83)**	9 (17)	0 (0.0)

and 8.75±2.20 which were categorized as moderate prevention index against COVID-19 and knowledge level, respectively.

Gender (p=0.012) had a significant result (p<0.05) on the prevention scores, while education level (p=0.028), age (p=0.015), and the source of information (p=0.003) were significant (p<0.05) to the knowledge score. This study results showed a score of 8.75±2.20 from a maximum score of 12. For prevention, the average scores was 38.79±6.18 from a maximum score of 50 (Table 1).

The composition of the frequency of respondents' knowledge levels and COVID-19 precautions was shown in Figure 1. The data showed that most respondents had a good knowledge level of COVID-19 (n=23; 44%), besides, there were 16 respondents (31%) who have a moderate level of knowledge, and 25% had a low level of knowledge. Meanwhile, from the COVID-19 preventive behavior index, it was found that as 46% had high preventive scores of behaviors, meanwhile 48% had moderate scores, and only 6% had low preventive measures.

The results of 12 statements regarding the level of knowledge about COVID-19 and 10 statements regarding the level of precautions about COVID-19 found that there was a correlation between level of knowledge and age, level of education, and history of COVID-19 vaccination. A strong negative relationship was found between the level of knowledge and the age of respondent which was significant (r=-0.346; p=0.012) along with a strong positive correlation between the level

Table 3 Prevention of COVID-19 in Banjar Gambang Communities, Seraya Village, Karangasem, Indonesia

Items of Questionnaire	Responses				
	Always n (%)	Often n (%)	Sometimes n (%)	Seldom n (%)	Never n (%)
Keep a distance of 1 meter in your everyday interactions with people outside of your household	16 (31)	**23 (44)**	7 (13)	5 (10)	1 (2)
Use a facemask when you leave your home	20 (38)	**22 (42)**	6 (12)	3 (6)	1 (2)
Work from home, if possible	14 (27)	**23 (44)**	9 (17)	5 (10)	1 (2)
Avoid any non-essential local travel	**17 (33)**	13 (25)	12 (23)	9(17)	1 (2)
Avoid any non-essential international travel	21 (40)	**23 (44)**	4 (8)	2 (4)	2 (4)
Wash your hands regularly	**23 (44)**	**23 (44)**	4 (8)	2 (4)	0 (0)
Keep informed about COVID-19	6 (12)	**19 (36)**	16 (31)	8 (15)	3 (6)
Not make any changes to your lifestyle	2 (4)	8 (15)	5 (10)	**19 (36)**	18 (35)
Continue to see people outside of your household	3 (6)	14 (27)	8 (15)	8 (15)	**19 (36)**
Comply with track and trace service, if contacted	**25 (48)**	19 (36)	2 (4)	5 (10)	1 (2)

of knowledge and the level of education with significant results obtained (r=0.323; p=0.02) (Table 2).

Another analysis of the correlation between preventive measures and age (r=0.268; p=0.055), education level (r=0.082; p=0.565), and history of COVID-19 vaccination (r=0.113; p=0.426) showed a weak correlation between preventive measures and age, education level, and history of COVID-19 vaccination which was not significant. There was a strong correlation between the level of knowledge about COVID-19 and precautions (r=0.548; p<0.001).

Discussion

This study found gender did not affect knowledge scores, however, women's prevention scores were found to be statistically

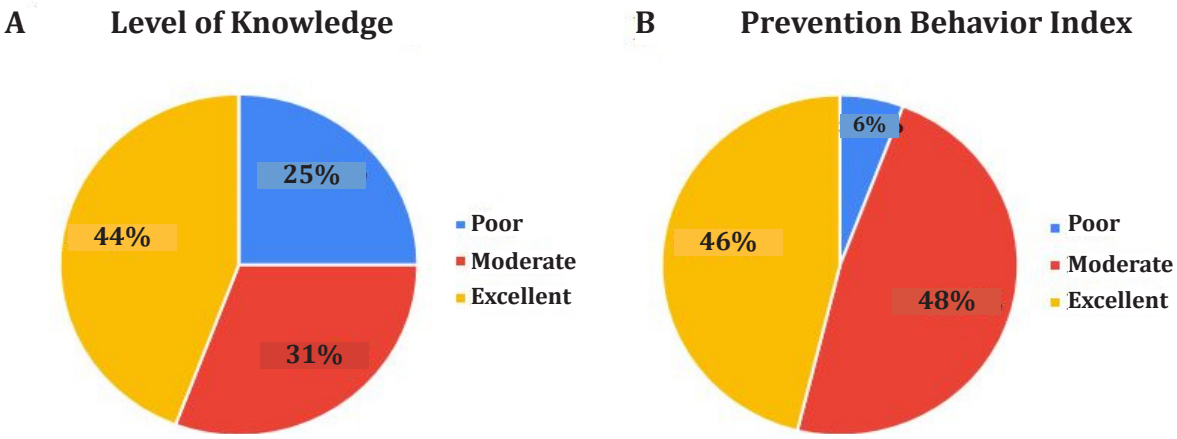

Figure 1 Frequency Composition of COVID-19 Knowledge Levels in Participants (A). Chart of the Frequency Composition of the COVID-19 Prevention Behavior Index (B).

significant. A study in Northern Nigeria has a similar conclusion, gender is not associated with the knowledge scores.[19] Interestingly, that study found significancy on the Prevention score. Meanwhile, a study conducted in Saudi Arabia reported that there was a gender significance in the knowledge score as well as on prevention score.[20] In Northern Nigeria the results might be due to the beliefs and customs that exist in that country. Good knowledge scores did not always show good prevention. For example, when asked whether they would attend a wedding during this pandemic, it was found that 58% of the participants who chose to remain present were participants who had a high knowledge scores. It was also found that 38% of participants would continue to attend funerals, 42% to Eid prayers, and 49% to Friday prayers, showing that culture and religion have an influence on choices and levels of prevention.[21]

Furthermore, our study has shown that age has a significance relationship with the knowledge score, aged less than 29 years have a higher average knowledge score, similar to study in Northern Nigeria[19] and Saudi Arabia.[20] In addition, study in Saudi Arabia has shown a relation between age and prevention score.[20] However, another research found that the level of knowledge was found to be better in the younger age range (36–65 years). Age might increase, the capability in storing new information and knowledge will be weaker. In contrary, in a study with a high predominance of the elderly population, it has shown that younger people have higher levels of knowledge.[15] From the three studies, almost the same results were obtained where age contributed to the knowledge score, this could occur due to an increase in understanding and information received with age.[20]

This research also found the significance of education on the knowledge scores, with the highest average knowledge scores being found in participants with high school education and sources of information were also significant on knowledge scores with the mass media as a main source of information. Research from Northern Nigeria and Saudi Arabia also found that there was a significant correlation between education and knowledge scores as well as prevention scores in Saudi Arabia.[19,20] In these studies sites, the sources of information on knowledge or prevention score were not included, however, 43% of participants in Northern Nigeria[19] received information from radio and 25% from health workers. The significance of education on knowledge scores can be explained by differences in processing information and also how much information can differ in each educational background.[19,20]

This study shows that there is a strong correlation and relationship between the level of knowledge and preventive measures for COVID-19. This finding is slightly different from the previous research which showed a weak correlation between the level of knowledge, action, and behavior toward the COVID-19 outbreak in the population of Central Iran.[22] This might happen because of the difference in the time of research, namely between 2020 and 2022. This comparison also shows that respondents who have a high level of knowledge are currently taking good precautions against COVID-19.

There were significant results between COVID-19 prevention measures in each category of knowledge level, indicating that people with a good level of knowledge have good COVID-19 prevention measures. Students with a good level of knowledge tend to take preventive measures against COVID-19, especially among public health students who may have often received education about COVID-19 on campus environment.[23]

A study in the Saudi Arabian population has shown that high level of prevention behavior of COVID-19 transmission is associated with high level of knowledge.[20] Vice versa, a lack of awareness of COVID-19 preventive measures is associated with a poor level of knowledge. This may be because self-report studies can lead to different interpretations in society.[24]

In Indonesia, similar result has been shown from Semarang, indicating relationship between the level of knowledge and the practice of preventing COVID-19.[25]

The reliability and validity test were not used in our questionnaire due to limited population. However, the tests were carried out using the population that had similar characteristic around several village in Bali, Indonesia that could represent the research sample.

In conclusion, most of the respondents has a good level of knowledge about COVID-19 and have taken moderate precautions by having the third dose of vaccination. In addition, age and education level play a significant role. Moreover, the preventive measures for COVID-19 are more predominantly carried out among female. Awareness programs need to be employed to increase knowledge, leading to more precautionary measures against COVID-19.

Acknowledgment
We would like to express our appreciation to the Hippocrates Scientific Group (KIH), Faculty of Medicine, Udayana University and all participants who have supported this research.

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