ORIGINAL ARTICLE
Public Health and Preventive Medicine Archive (PHPMA) 2023, Volume 11, Number 1: 80-88
E-ISSN: 2503-2356

PHPMA
Published by
Department of Public Health and Preventive Medicine, Faculty of Medicine, Udayana University

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Associations between knowledge, beliefs, and self-efficacy with COVID-19 preventive behavior in Denpasar, Bali Province

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ABSTRACT

Background and purpose: Positive cases of COVID-19 in Bali have been growing rapidly during the pandemic. Denpasar City has contributed almost one-third of all cases with a high incidence of local transmission. Preventive action is pivotal to halt transmission; thus, this study aims to determine the association between knowledge, belief, and self-efficacy with COVID-19 preventive behavior in the Denpasar, Bali Province community.

Methods: This cross-sectional study was conducted in Denpasar City, Bali. The study involved 1040 respondents with an age range of 18-59 years. Data collected include sociodemographic characteristics, knowledge and perception on COVID-19 and preventive behaviour. Online questionnaires in Google form format were distributed via WhatsApp groups from February to March 2021. Data obtained were analyzed using the Chi-Square test followed by Logistic Regression.

Results: The respondents' mean (SD) age was 35 years (4.98), and 52.7% were male. The education level was considered high, with the majority finishing Senior High School/College (99.2%), and most were working or holding a job (94.4%). Factors that were significantly associated with COVID-19 prevention behavior in Denpasar City were knowledge about COVID-19 (AOR=2.43; 95%CI: 1.70-3.48), a belief in susceptibility to COVID-19 (AOR=4.03; 95%CI: 2.34-6.94), a belief in the seriousness of the disease (AOR=2.91; 95%CI: 1.84-4.60), a belief in the benefits of prevention (AOR=8.38; 95%CI: 4.37–16.06), and self-efficacy (AOR=2.10; 95%CI: 1.45-3.05).

Conclusion: Knowledge, belief, and self-efficacy are associated with COVID-19 preventive behavior in the community of Denpasar City. Awareness campaign is important to ensure adequate knowledge level attained especially for such a new emerging disease.

Keywords: COVID-19; preventive behavior; knowledge; beliefs; self-efficacy

INTRODUCTION

Corona Virus Disease 2019 (COVID-19) has been declared a global pandemic by the World Health Organization (WHO) since March 11, 2020. The Indonesian government announced the first patient with COVID-19 in March 2020, and after one year, COVID-19 in Indonesia had infected 207,203 people with 8,456 deaths, and 150,217 people have been declared cured.[1] Bali Province, as an international and domestic travel route from areas affected by COVID-19, has a high risk of transmission.[2] In mid-September 2020, Bali ranked 8th with the number of positive cases 6,978 (3.3%) and 161 deaths (2.3% of the confirmed positives). In Denpasar, positive cases counted to 1,961, with 30 deaths and 1,704 recovered. The probability of infection per 10,000 population in Bali Province was 17.93, while DKI Jakarta was 53.74, West Java was 3.23, East Java was 9.99, and Central Java was 5.27.[1]

The provincial government in Bali had issued two crucial regulations to respond to the pandemic, the Bali Provincial Governor Regulation Number 56 of 2020 concerning the Policy Package for the Acceleration of COVID-19 Handling in Bali and the Circular Letter Number 487/GugusCOVID19/IX/2020 concerning strengthening the prevention and control of COVID-19 in Bali. The circular letter states that massive information dissemination to increase public awareness in protecting their health and others from COVID-19 is delegated to all stakeholders, which is done by implementing health protocols and the good hygiene and healthy lifestyle (locally known as "PHBS").[3]

In the new normal era, the Indonesian government has established several public policies per WHO advice for precautionary measures and breaking the chain of transmission of COVID-19, which includes physical distancing, large-scale mobility restrictions for areas with the greatest potential for transmission, prohibition of homecoming during major holidays, hand washing with soap, always wearing masks, work from home, as well as self-isolation or quarantine for positive cases. In addition, the government conducted contact tracing for case detection.[4]

There have been conflicting findings in the role of the environment and individual factors in the decision to abide COVID-19 prevention measures. According to Prasetyo, Castillo, Salonga, Sia, & Seneta, people who live in environments with healthy lifestyles have a biased view of their disease susceptibility, so they are more likely to ignore health protocols such as not wearing masks, ignoring physical distancing, and not washing their hands.[5] On the other hand, Sari & 'Atiqoh found that factors affecting compliance with COVID-19 prevention include knowledge, motivation, and belief in disease control and prevention efforts, the environment, and the quality of health instructions.[6]

The Health Belief Model (HBM) highlights factors contributing to the individual's response to health threats through several aspects of belief e.g., perceived severity, perceived susceptibility, perceived barriers, perceived benefits, self-efficacy, and cues to action.[7] Several factors, including knowledge, individual beliefs, emotions, motivation, and the environment, influence health behavior. In HBM, individual belief is the main driver influencing individual health behavior. Individuals who consider themselves susceptible to contracting the disease, believe in the emergence of severe conditions due to the disease, believe that taking the right action can prevent the seriousness of the disease, and believe that the benefits of taking action outweigh the obstacles; thus, they tend to take steps that they believe will reduce risk.[7]

With the growing number of COVID-19 cases coming from local transmission in Bali Province, especially in Denpasar City, it is important to determine factors associated with preventive behavior in the community in Denpasar. The study results will feed the development of COVID-19 prevention and control strategy in the area

and Indonesia at large. Based on the HBM, this study aims to explore the association between knowledge, belief, and self-efficacy regarding the disease with COVID-19 preventive measures.

METHODS

This research was an observational study with a cross-sectional study design. The study was conducted from February until March 2021. The population of Denpasar City aged 18-59 years is 474,309 people, and the total number of respondents who met the inclusion criteria and had complete data was 1,040. The inclusion criteria were people aged 18-59 years old who domiciled and lived/settled in Denpasar City. Data were excluded if they were duplicates or incomplete. Voluntary sampling was used, and data were collected using an online questionnaire in Google form format. Invitations to participate were distributed to respondents through the "Banjar" (Balinese traditional village community) WhatsApp group. The sample distribution includes 290 in North Denpasar, 189 in East Denpasar, 266 in South Denpasar, and 295 in West Denpasar.

Data collected were including sociodemographic characteristics: age, gender, respondent's education level and respondent's occupation; knowledge and perception according to HBM theory including perceived susceptibility, perceived severity and perceived benefit. Knowledge was measured with 17 questions which cover respondent's understanding on COVID-19 including the cause, symptom, transmission and preventive measures with a scale of 1 to 4. The level of knowledge was categorized as "good" if the total score 23 or above. The perception was measured with 15 questions including perceived susceptibility with 5 questions, perceived severity with 5 questions and perceived benefit with 5 questions, with a scale of 1-4. The perception for each dimension was categorized as "good" if the total score 12.5 or above.

The questionnaire was tested for validity and reliability using Pearson's product-moment correlation and Cronbach's alpha (0.60). Data were analyzed in descriptive analysis, bivariable analysis (chi-square test), and multivariable analysis (logistical regression). After obtaining the bivariate analysis results, a multivariate analysis was conducted using logistic regression. In the first step, simple logistic regression was performed to measure the crude association of each variable. Then variables which met the inclusion criteria of p-value<0.05, were included in the multivariate model. The Enter method was used for this logistic regression analysis.

The research has been approved by the Faculty of Medicine Ethics Committee, Udayana University/Sanglah Hospital with the ethical clearance approval No. 522/UN14.2.2.VII.14/LT/2021 on February 26, 2021.

RESULT

Most respondents were between 18-29 years old (55.1%), with an average age of 35 years, and slightly more than half (52.7%) were male. Based on the education level of the respondents, most of them have high-level education (Senior High School/College) (99.2%), with most of them working (94.4%) (Table 1).

Being male, having a higher level of education, and having an occupation or working were all associated with higher odds of good preventive behavior. However, these factors were not statistically significant. On the other hand, younger age was considered a protective factor. Being in the younger age bracket (18–29 years) increased the chance for good preventive behavior by 1.4 times (OR = 1.442; 95% CI = 1.111-1.871) (Table 2).

Table 1. Sociodemographic characteristics of the respondents

Characteristics	Frequency (n=1040)	Proportion (%)
Age (years)		
18-29	573	55.1
30-59	467	44.9
Sex		
Female	492	47.3
Male	548	52.7
Education Level		
High (senior high school and university degree)	1032	99.2
Low (junior high school or lower)	8	0.8
Occupation		
Working	982	94.4
Not Working	58	5.6

Table 2. Associations between sociodemographic characteristics with COVID-19 preventive behavior

Variable	Preventive behavior				OR	95%CI OR	p
	Good		Lacking				
	n	%	n	%			
Age							
18-29 year	408	39.2	165	15.9	1.44	1.111 – 1.871	0.006*
30-59 year	295	28.4	172	16.5	Ref		
Sex							
Female	346	33.3	146	14.0	0.78	0.607-1.024	0.075
Male	357	34.2	191	18.4	Ref		
Education							
High	697	67.0	335	32.2	1.44	0.289-7.182	0.653
Low	6	0.6	2	0.2	Ref		
Occupation							
Working	667	64.1	315	30.3	0.77	0.447-1.336	0.355
Not Working	36	3.5	22	2.1	Ref		

**chi-square test*; $p<0.05$

The majority of respondents had good preventive behavior (67.6%), more than half (53.8%) had good knowledge, a hefty majority had a high belief in susceptibility (83.1%) and a high belief in the seriousness of the disease (78.2%) as well as had a high belief in the benefits of preventive measure (85.5%). However, more than one-third (31.2%) perceived themselves as having low self-efficacy in implementing preventative measures. Further, the Chi-Square test on HBM domains showed that higher knowledge (OR=2.493; 95%CI: 1.910-3.255), belief in susceptibility to COVID-19 (OR=14.966; 95%CI: 9.923-22.570), belief in the seriousness of the disease (OR=7.263; 95%CI: 5.255-10.037), belief in the benefit of preventive measure (OR=31.034; 95%CI: 17.800-54.109) and higher self-efficacy (OR=3.752; 95%CI: 2.857-4.927) were all significantly associated with good preventive behavior (Table 3).

Table 3. Associations between knowledge, belief, and self-efficacy with COVID-19 preventive behavior

Variables	Preventive behavior				OR	95%CI	p
	Good		Lacking				
	n	%	n	%			
Knowledge							
Good	429	41.3	130	12.5	2.49	1.91-3.26	0.001*
Poor	274	26.3	207	19.9	Ref		
Belief in susceptibility							
High	670	64,4	194	18.7	14.96	9.92-22.57	0.001*
Low	33	3.2	143	13.8	Ref		
Belief in seriousness							
High	630	60.6	183	17.6	7.26	5.26-10.04	0.001*
Low	73	7.0	154	14.8	Ref		
Belief in benefits							
High	688	66.2	201	19.3	31.03	17.80-54.11	0.001*
Low	15	1.4	136	13.1	Ref		
Self-Efficacy							
High	499	48.0	133	12.8	3.75	2.86-4.93	0.001*
Low	204	19.6	204	19.6	Ref		

**Chi-square test*; $p<0.05$

Table 4. Logistic regression of factors associated with COVID-19 preventive behavior

Variable	Initial Model			Final Model		
	AOR	95%CI	p	AOR	95%CI	p
Age (years)						
18-29	1.31	0.94-1.81	0.101			
30-59	Ref	Ref				
Sex						
Male	0.75	0.54-1.05	0.097			
Female	Ref	Ref				
Knowledge						
Good	2.40	1.68-3.44	0.001	2.43	1.70-3.47	0.001*
Poor	Ref	Ref		Ref	Ref	
Belief in susceptibility						
High	3.98	2.31-6.87	0.001	4.03	2.34-6.94	0.001*
Low	Ref	Ref		Ref	Ref	
Belief in seriousness						
High	2.89	1.82-4.57	0.001	2.91	1.84-4.59	0.001*
Low	Ref	Ref		Ref	Ref	
Belief in benefits						
High	8.44	4.39-16.22	0.001	8.379	4.37-16.06	0.001*
Low	Ref	Ref		Ref	Ref	
Self-efficacy						
High	2.08	1.43-3.03	0.001	2.10	1.44-3.05	0.001*
Low	Ref	Ref		Ref	Ref	

**Logistic regression*; $p<0.05$

All variables showed a significant association with preventive behavior in the Chi-Square test were then included in the logistic regression analysis to determine the strongest factors in predicting better COVID-19 preventive behavior. The likelihood to implement preventive behavior among the respondents in order was as follows; respondents who perceived that preventive measures are highly useful or beneficial had an Adjusted Odds Ratio (AOR) of 8.379 (95%CI: 4.371-16.063), those who perceived that their susceptibility to COVID-19 infection is high showed an AOR of 4.032 (95%CI: 2.341-6.942), respondents who believed that COVID-19 could cause a severe disease showed an AOR of 2.910 (95%CI: 1.842-4.596), those with good knowledge about COVID–19 showed an AOR of 2.434 (95%CI: 1.703-3.477) and respondents with high self-efficacy showed an AOR of 2.101 (95%CI: 1.445-3.053). Hence, a higher belief in the benefit of prevention, belief in susceptibility, belief in seriousness, knowledge, and self-efficacy were all significantly associated with good preventive behavior. However, the strength of the relationship varied.

DISCUSSION

Community preventive behavior against COVID-19

This study found that most respondents had good preventive behavior against COVID-19. This can be partially associated with their education level and occupational status, as most respondents had high education and occupation, although the relationship was not significant. This finding echoed what was found in other studies, that respondents with higher education levels are usually more accessible, faster, and more able to receive and digest information.[8]

Behavior is a response or reaction to a stimulus. In previous studies on the analysis of Indonesian people's behavior when dealing with the COVID-19 pandemic and tips for maintaining mental health, Notoatmodjo found that disobedience to government advice is often based on cognitive bias.[9] Cognitive bias is a systematic thought process resulting from filtering information or phenomena based on personal experiences, reason, information, and emotional needs or also called the perceptual component.[10] The wisdom of realizing the value of health only after someone is sick is an example of how one can develop biased beliefs about the disease.[11] Therefore, despite the encouraging finding that most respondents showed good preventive behavior, there is still a wide room for improvement, considering more than one-third of the respondents had shown poor preventive behavior.

The relationship between knowledge, belief, and self-efficacy with COVID-19 prevention behavior in Denpasar City

This study shows that most respondents know and understand COVID-19 prevention behavior, including the disease, causes, signs and symptoms, modes of transmission, and ways to prevent COVID-19. However, someone with good knowledge may only sometimes implement COVID-19 prevention properly due to various factors.[8] This study found that good knowledge was significantly associated with good preventive behavior. Therefore, it supports results from several previous studies showing that knowledge has a positive association with behavior for COVID-19 prevention;[12,13] and good prevention or preparedness behavior correlated with higher levels of knowledge.[14] Furthermore, research by Chan et al. in Hong Kong shows that people with low levels of education have relatively poor knowledge of COVID-19 prevention behaviors such as washing hands with soap, using masks, using public transportation, and visiting public places with high risk, which is mainly due to a lack of perceived risk about the dangers of COVID-19 infection.[15]

The higher a person's level of knowledge, the easier it is for them to understand information obtained from

many sources, including their peers, the media, and health workers. Nowadays, the sophistication of electronic devices and social media utilization increase the ease of obtaining information to help improve one's knowledge, including about COVID-19 prevention.[16] It is safe to assume that respondents with a good level of knowledge had better access to obtain knowledge regarding COVID-19 and its prevention. Self-awareness is needed to access information related to disease outbreaks more often. Because there is now a lot of access to information, the importance of having a good level of knowledge can be a preventive behavior and can increase understanding of disease.

Our study analysis shows that most respondents had a high belief in susceptibility to COVID-19, in the seriousness of the disease, and in the benefits of prevention. These factors were significantly associated with good preventive behavior. This result supports previous findings highlighting a positive correlation between beliefs and prosocial behavior, where individuals tend to behave well when they have good beliefs.[17] Previous research also found that understanding COVID-19 increases the intention to prevent the disease.[18] As found in our study, belief in susceptibility to COVID-19 was strongly associated with better preventive behavior; another study also pointed out that good preventive behavior was a function of increasing belief in susceptibility.[17]

The result on self-efficacy showed that most respondents had good self-efficacy regarding COVID-19 preventive behavior. A study among employees in Addis Ababa-Ethiopia, utilizing the HBM, shows that despite the low perceived barriers, their cues to act were low. Self-efficacy was low, thus resulting in the low practice of COVID-19.[19] Therefore, since our study shows that the self-efficacy among our respondents in Denpasar City was good, it is expected that they tend to have better preventive behavior. Hence, the recommendation to improve the adoption and implementation of preventive behavior should also address the self-efficacy domain.

This study involved big sample size; however, it has some limitation. The questionnaire was shared via online channel and self-reported, there is a potency of social desirability bias on the response. We also not sure if the questionnaire was filled independently by all respondents.

CONCLUSION

The study found that most respondents had good preventive behavior, self-efficacy about prevention, and knowledge about COVID-19. They also had a high belief in susceptibility, seriousness of the disease, and the benefits of preventive measures. In addition, this study also found that a higher belief in the benefit of prevention, belief in susceptibility, belief in seriousness, and higher knowledge and self-efficacy were all significantly associated with good preventive behavior in the community in Denpasar City.

Therefore, efforts to improve the adoption and implementation of COVID-19 prevention must consider these dimensions. Health promotion and education in Denpasar City should be improved and conducted through a multitude of approaches, from local attempts via direct education in "Banjars," markets, malls, tourist attractions, and other public places using simple tools such as loudspeakers, to keep reminding the public of the importance of implementing health protocols. In the future, more systematic research is expected to be able to explore other aspects or domains such as perceived barriers, cues to action, and other modifying factors such as psychological factors, cultural/environmental background, and social pressure.

ACKNOWLEDGMENT

The authors thanks all the respondents for their contribution to this study.

AUTHOR CONTRIBUTION

NPIR: developed the study, collected and analysed the data, and wrote the first draft of manuscript; IMAW and NKTA: developed the study, supervised data collection and analyses, edited the manuscript

CONFLICT OF INTEREST

None declared

FUNDING

Self-funded

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