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Factors related to adherence to stay at the isolation house and health protocols for COVID-19 confirmed positive people in Denpasar, Bali, Indonesia

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ABSTRACT

Background and purpose: Quarantine in the isolation house for people who are confirmed having COVID-19 is essential to reduce transmission in the community. This research aimed at determining factors associated with compliance to isolation for 14 days and the implementation of health protocols for people who are confirmed positive for COVID-19.

Methods: This study applied analytic cross-sectional design, which was conducted in the working area of the Public Health Centre (PHC) II North Denpasar. The samples were 279 people whom selected by simple random sampling. The collected data included sociodemographic characteristics, adherence to stay in the isolation houses and to apply health protocols, perceptions to compliance, cues to action, self-efficacy, knowledge, and social support. The data were analysed by Stata including descriptive analysis, followed by Chi-square Test and Multiple Logistic Regression.

Results: As high as 60.6% of respondents complied to stay for 14 days in the isolation house and implemented health protocols. From multivariable analysis, the higher likelihood to comply with staying at the isolation houses for 14 days and applying health protocols were among female (AOR=3.02; 95%CI: 1.54-5.90, having higher education (AOR=6.03; 95%CI: 3.09-11,77), those having high self-efficacy (AOR=3.43; 95%CI: 1.81-6.50), and those having good knowledge (AOR=2.18; 95%CI: 1.19-3.98).

Conclusion: About a third of the respondents did not comply with isolation for 14 days in the isolation house nor apply etiquette according to the health protocols, thus indicating a high risk of transmitting COVID-19 to others. It is necessary to promote health targeting people with low knowledge level and to provide social support from family, surrounding community and government.

Keywords: COVID-19, isolation compliance, health protocols, isolation houses, public health centre

INTRODUCTION

The World Health Organization (WHO) declared COVID-19 as a global pandemic that first occurs in Wuhan, China at the end of 2019 and spreads to countries in the world including Indonesia.[1] Since first case was announced on the 2nd of March 2020 in Indonesia, COVID-19 has been swiftly spread in several provinces of Indonesia. As of October 21st, 2020, there have been 373,109 confirmed cases of positive COVID-19 with 12,857 people died (3.7%) and 279,509 (74.91%) recovered. In the Province of Bali, the number of COVID-19 cases as of October 21st, 2020 was 9,019 confirmed cases and 7,487 (83.01%) recovered, with this number continued to elevate due to the increase in the number of local transmission cases.[2]

Efforts to prevent and control the COVID-19 pandemic were carried out in various ways, from washing hands with soap, using masks, practicing social distancing, to establishing regional quarantine.[3,4] To control the transmission of COVID-19, contact tracing efforts were carried out in the community groups who had a history of contact with confirmed positive cases, then rapid-test and swab-test were carried out. Furthermore, patients who were confirmed positive for COVID-19, with mild or no symptoms, were isolated in the isolation house that had been prepared by the government or immediately referred to a hospital for patients with moderate to severe symptoms.[5]

Community compliance in implementing health protocols, including during the isolation period in the isolation house, was the key to success in restraining the transmission of COVID-19. This is also a strategic attempt in preventing the occurrence of local transmission of COVID-19 in the community. Amid the continued rise in the number of local transmission cases of COVID-19, there remained some people who did not comply with the health protocols. The COVID-19 pandemic has caused an uproar in the community, due to the rapid flow of information circulating in the community without being balanced by the readiness of the community to sort, filter, and receive information. This issue had been spreading and causing a negative stigma phenomenon, so people who were confirmed positive for COVID-19 refused to be isolated at the isolation house due to the fear of not being accepted in society and being discriminated. There also have been several rejections of health workers and patients with COVID-19.[6–8]

In Bali, people who are not discipline in implementing isolation have led to an increase in cases of local transmission.[9] Hence that centralized isolation in the isolation house is very crucial to prevent the spread of COVID-19. Bali government policy, specifically the governor made a circular letter number: 487/GugusCovid19/VII/2020 regarding Strengthening the Prevention and Control of COVID-19 in Bali, with the item 6 states that every person who is confirmed positive for COVID-19 must be isolated in the isolation house that has been prepared by the government in order to prevent local transmission.

The COVID-19 was spiking in Denpasar until October 21st, 2020. In Denpasar, 3,046 cases were confirmed positive for COVID-19, 2,816 recovered (92.4%) and 69 died (2,26%) with 344 were self-isolating. Public Health Centre (PHC) II North Denpasar, is one of the PHCs with a large number of COVID-19 cases, as of October 21st, 2020, a total of 615 cases confirmed positive for COVID-19, 578 people recovered (93.98%) and 5 died (0.8%). There were 102 confirmed cases who refused to be referred to the isolation house and these cases could transmit to their families and surrounding communities (close contact) resulting in local transmission with the family cluster. Therefore, it is essential to explore compliance to stay at the isolation house and implementation of health protocols for those confirmed positive COVID-19. This research aims to determine the factors related to compliance with isolation at the isolation houses and the

implementation of health protocols among COVID-19 confirmed positive people in the working area of PHC II North Denpasar.

METHODS

This study applied a cross sectional analytic approach. Data collection was conducted from November 2020 until January 2021. The target population were people who were confirmed positive for COVID-19 in Denpasar, while the samples were 513 people who were confirmed positive for COVID-19 and referred to the isolation house by the PHC II North Denpasar. The sample size was calculated using the WHO Sample Size application with the formula for comparison of the proportions of two groups, which resulted in minimum sample size of 136 in each group or a total of 272 minimum sample size. The samples were then selected using simple random sampling method. The study was able to reach and interview 279 samples.

The independent variables of this study were the patient's socio-demographic characteristics, the patient's perception, self-confidence, cues to action, knowledge, and social support. Whereas the dependent variables were compliance with isolation in the isolation houses and the application of health protocols among people who are confirmed positive for COVID-19. The variables of perception, self-confidence, and cues to action were measured using a 6 points of Likert scale, a scale of 1 (strongly disagree) to a scale of 6 (strongly agree) for each question. The total score is classified into "high" and "low" based on the average scores as the cut off points.

Respondent's knowledge related to COVID-19 was assessed using 12 questions, which consisted of correct, incorrect, and don't know answer choices. Each item with the correct answer would get a score of 1, however each wrong answer and don't know would get a score of 0. Knowledge was grouped into "good" and "poor". Knowledge categorized as "good" if the score is 70% or more and poor if the score is less than 70%. Social support is measured using 5 questions related to support from friends, family, and the surrounding environment. The answer choices for this question consist of "decreased", "fixed/unchanged", and "increased". Each answer option is given a score, (1=decreased), (2=fixed/unchanged), (3=increased). The higher the score obtained, the better the social support acquired.

Data collection was conducted using the self-administered questionnaires with Google Form and the link was sent to the respondents by the researcher. Before being used for data collection, this questionnaire was tested toward 20 people and then tested for validity and reliability using the Pearson Product moment test. The outcome of the validity test of all questions are valid and reliable with a Cronbach value, Alpha 0.981. Descriptive analysis was conducted, followed by bivariable analysis using Chi Square Test. Then, multivariable analysis using logistic regression test was performed with inclusion criteria for variables to be included in model building if the p value <0.2 in the bivariate analysis.

This research has received an ethical approval from The Research Ethics Committee of the Faculty of Medicine Udayana University/Sanglah Hospital Denpasar, with number: 2305/UN14.2.2.VII.14/LT/2020 dated 19th November 2020.

RESULT

Table 1 shows that of the 279 respondents, the average age was 39.25 years old, the youngest being 18 years old and the oldest being 71 years old. Based on gender characteristics, there are more women, specifically 189 people (66.7%). It was also shown that more than half of respondents (56.99%) had lower

level of education (junior high school and below) and about half (140 people/50.2%) of respondents have job as formal workers (work in Government Ministries/departments). For compliance to stay at the isolation house and to implement health protocols, as many as 169 people comply to both (60.9%) and as many as 110 respondents (39.4%) did not comply to stay at isolation house nor to implement health protocols. Among those who did not comply, 36.2% did not wash their hands with soap and running water, 12.0% did not use masks properly and correctly, and as many as 38.7% did not comply with social distancing.

Table 1. Sociodemographic characteristics of respondents, compliance to stay at the isolation house and to implement health protocols (n=279)

Characteristics	Frequency	Percentage
Age		
Average (SD)	39.25 (15.27)	
Min-Max	18–71	
Teenager (18-20 years)	117	41.9
Adult (21-59 years)	149	53.4
Elderly (≥60 years)	13	4.7
Gender		
Male	93	33.3
Female	186	66.7
Education Level		
Low	159	56.9
High	120	43.01
Profession		
Unemployed	77	27.6
Formal workers	140	50.2
Informal workers	59	21.1
Health workers	3	1.1
Compliance to stay and to implement health protocols at isolation house		
Comply	169	60.9
Not comply	110	39.4

The outcome of the bivariable analysis on compliance to isolation in the isolation houses and the application of health protocols based on sociodemographic characteristics are presented in Table 2. The variables significantly associated with compliance were gender, education level, cues to action, self-efficacy, knowledge and social supports.

From the outcome of bivariable analysis, nine independent variables met the criteria to be included in the multivariable analysis using Logistic Regression. Logistic Regression was conducted on the variables of age, gender, education level, occupation, cues to action, self-efficacy, knowledge, and social support to establish the correlation with respondent's compliance to isolation in the isolation house for 14 days and the implementation of health protocols to prevent COVID-19 (Table 3).

Table 3 presents the outcome of the multivariable analysis. There are four independent variables that have a significant correlation with compliance, specifically being female (AOR=3.015; 95%CI: 1.542-5.895), having higher education level (AOR=6.027; 95%CI: 3.086-11.774), high self-efficacy (AOR=3.428;

95%CI: 1.807-6.501), and good knowledge (AOR=3.177; 95%CI: 1.191-3.978). Education level showed the highest adjusted odd ratio, those with higher education were 6 times more likely to be compliant to isolation in the isolation houses and implementation of health protocols.

Table 2. Compliance to isolation in the isolation houses and implementation of health protocol based on sociodemographic, knowledge and perception

Variables	Compliance				p
	Comply		Not Comply		
	f	%	f	%	
Age					
Teenager	75	64.1	42	35.9	
Adult	87	58.4	62	41.6	0.562
Elderly	7	53.8	6	46.2	
Gender					
Male	44	47.3	49	52.7	0.001
Female	125	67.2	61	32.8	
Education level					
Low	136	48.7	23	2.5	<0.001
High	100	35.8	20	7.2	
Profession					
Unemployed	44	57.1	33	42.9	
Formal workers	84	60.0	56	40.0	0.517*
Informal workers	38	64.4	21	35.6	
Health workers	3	100.0	0	0.0	
Perception					
Poor	88	63.8	50	36.2	0.280
Good	81	57.4	60	42.6	
Cues to action					
Low	50	51.5	47	48.5	0.024
Poor	119	65.4	63	34.6	
Self-efficacy					
Low	77	47.8	84	52.2	<0.001
High	92	78.0	26	22.0	
Knowledge					
Poor	51	42.9	68	57.1	<0.001
Good	118	73.8	42	26.3	
Social Support					
Low	13	34.2	25	65.8	<0.001
High	156	64.7	85	35.3	

Notes: *Fisher's Exact Test

DISCUSSION

This study found a large number of respondents did not comply with the isolation protocol in the isolation house for 14 days. This is concerning because if many people do not comply, it can spread COVID-19 and will take longer time to control the pandemic. This study also discovered that there were respondents who did not comply to the health protocols including don't wash their hands with soap and running water, disobey the proper use of mask and social distancing recommendation. Compliance of patients towards 14 days isolation in this study were higher than in Jakarta with the percentage of non-compliance reaching 60.0%.[10] However, since the population of our study is confirmed positive people, so there was a high risk of transmitting the disease to others. This becomes a serious concern that may hamper the prevention and control of COVID-19, thus measures to improve compliance should be thoroughly explored.

Table 3. Factors associated with compliance to stay at the isolation houses and application of health protocols

Variables	AOR	95%CI		p
		Lower	Upper	
Age				
Teenager	Ref			
Adult	1.508	0.305	7.466	0.614
Elderly	1.897	0.382	9.434	0.434
Gender				
Male	Ref			
Female	3.015	1.542	5.895	0.001*
Education level				
Low	Ref			
High	6.027	3.086	11.774	<0.001*
Profession				
Unemployed	Ref			
Formal workers	0.868	0.433	1.740	0.690
Informal workers	0.932	0,379	2,291	0.879
Health workers	0.951	0,068	1,919	0.999
Perception				
Poor	Ref			
Good	1.060	0.579	1.941	0.851
Cue to action				
Low	Ref			
High	1.267	0.673	2.387	0.464
Self-efficacy				
Low	Ref			
High	3.428	1.807	6.501	<0.001*
Knowledge				
Poor	Ref			
Good	2.177	1.191	3.978	0.011*
Social Support	Ref			
Low	2.103	0.850	5.204	0.108
High				

In our study, we found females tend to be more obedient in going through isolation for 14 days and implementing health protocols compared to male. This research is also in line with the City of Depok where discovered that the percentage of adherence in women (61.6%) was higher than men (44.2).[11] Female usually have more positive attitude toward health related measures, while the overall less mobility of some female groups may also contribute to better compliance to isolation measures.

We found education level has a positive effect on respondent's compliance to stay in the isolation house for 14 days and applying health protocols. The finding in this research is also in line with other study which discovered that a person's education level has a positive effect on determining adherence to isolation.[12] This can be caused by the higher a person's education, the more often they are exposed to information related to COVID-19 that influenced compliance behavior in going through the isolation. Education level is associated with better   knowledge which will associated positively with behaviour.

Respondents' knowledge related to COVID-19 also has a positive influence on compliance with the isolation in the isolation houses for 14 days and implementing health protocols. This finding are also in line with a study which found that good knowledge of COVID-19 affected respondent's decision in reducing

risky behaviors that threaten their health and safety, one of which is by implementing health protocols and isolation to avoid COVID-19.[13] On the other hand, perception does not have a notable correlation with adherence to isolation in the isolation house. This is not in line with a study finding in China which states that perception does affect adherence in patients undergoing isolation, due to different context and setting.[14]

Self-efficacy has a positive effect on respondent's compliance to isolation in the isolation houses for 14 days and implementing health protocols to prevent the spread of COVID-19. These results were also discovered in a systematic review which stated that respondents' self-efficacy can increase the respondent's motivation to obey with the health protocols and isolation, so as to prevent the spread of COVID-19.[15] Other research also discovered that high self-efficacy causes respondents minimize risky behavior that threatens their safety, so they will tend to comply with health protocols and isolation.[16]

This study did not find a correlation between age and occupation with adherence to isolation in the isolation house for 14 days and the application of health protocols. The results of this study are different from the study in New Zealand which found increasing a person's age had an effect on increasing compliance.[17] This is associated to the risk of higher severity experienced in elderly COVID-19 patients. The higher a person's age, the probability for experiencing severe symptoms due to COVID-19 is higher. A study conducted in Israel discovered occupation was strongly associated with low isolation compliance.[18] Many people who are supposed to go through isolation afraid to lose their occupation. Although in Denpasar a person who is isolated in the isolation house does not receive an incentive in the form of money, the government has prepared a place of isolation for free. Family members of the patients undergoing quarantine were also given free compensation for 14 days by the COVID-19 task force in the villages.

The cue to act is not related to compliance to isolation in the isolation houses for 14 days, although there are regional regulations that require people who are confirmed to be positive to undergo isolation in the isolation house within the framework of the program to prevent transmission and control of COVID-19. This is different from the discoveries in France, that mandatory isolation rules issued by the government affect public compliance in isolating and applying protocols for preventing the spread of COVID-19.[19] Reflecting on this, the mandatory isolation rules issued by the government in Bali also do not significantly influence the respondent's compliance in terms of isolation in the isolation houses for 14 days as well as obedience with implementing health protocols to prevent the spread of COVID-19. This is due to dynamic policy regulations from the central government in line with the development of research related to the COVID-19 pandemic. A prolonged pandemic can also cause people to feel exhausted and weary, and experienced economic difficulties.

Social support was not statistically related to respondent's compliance with isolation in the isolation houses for 14 days and implementation of health protocols. Nonetheless social support plays a very crucial role in changing a person's behavior to comply or not to the applicable regulations. Social support can come from family members, friends/best friends, the surrounding community as well as support from respected figures in the community where we are and supported by the government. Social support by the government and community leaders can also prevent stigma and discrimination against people who are confirmed positive for COVID-19. Meanwhile, a study in Argentina discovered that the existence of social support from the government had an effect on compliance with isolation in preventing COVID-19.[19] The different finding in this research can be based on the differences in access to information and public perceptions in regard to the COVID-19 pandemic, when compared to studies in other countries. In Bali, form of social supports can be encouraged through *banjar* which is the smallest administrative unit below village level.

The finding from this study can be used as a basis for the government and other stakeholders to develop

interventions and policies, especially improving compliance for isolation in the isolation houses for 14 days and implementation of health protocols, one of the endeavors that can be intensified is through health promotion efforts via social media which is popular among the public. The government also continues to strive to maintain the quality of services provided, especially improving comfort and health services for people who are confirmed positive for COVID-19.

There were several limitations of this study. The respondents came only from the data of one PHC from 11 PHCs in Denpasar, so they may not represent the circumstances at the other PHCs in the city. The study was conducted based on respondent's self-report, there is a potency of social desirability bias.

CONCLUSION

The level of compliance to isolation for 14 days in the isolation houses is 60.6%. Compliance with health protocols relatively high but there are some violations including 36.2% of respondents did not wash their hands with soap and running water, 12.0% did not use masks properly and correctly, and as many as 38.7% did not comply with social distancing. Gender, education level, self-efficacy, and knowledge related to COVID-19 are correlated to respondent's compliance in isolating for 14 days in the isolation houses and implementing health protocols.

We recommend PHC to improve health promotion with procedure that are in accordance with the target of low education level and knowledge as well as develop communication and coordination with regional supervisors from the *banjar* (smallest administrative unit below village) level to the subdistrict level.

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AUTHOR CONTRIBUTION

NNS: designed the study, collected and analyzed the data, wrote the first draft of manuscript; NPW and NKS: designed the study, provided guidance for data analysis and edited the manuscript.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest

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