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Access to Social Media, Knowledge, and Acceptance of COVID-19 Post-Vaccination Health Protocols: A Cross-Sectional Study

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Abstract

The health protocols recommended by the health authorities still need to be practiced after having the COVID-19 vaccine. Education on the prevention of COVID-19 infection needs to continue to protect people from the disease. This study aimed to determine the factors associated with adhering to COVID-19 post-vaccination health protocols in people aged 18 years and over in the South Denpasar Subdistrict. This cross-sectional study comprised a sample of 147 people who were selected by incidental sampling. The data were obtained using questionnaires from July to August 2022 and examined with bivariate and multivariate analysis. Most participants were female, private employees, went to senior high school, accessed social media, had high knowledge of COVID-19, and properly followed health protocols post-vaccination. However, only 34.7% of participants accepted the government's policy for preventing COVID-19. Multivariate analysis showed that good social media access (aOR = 11.9; 95% CI = 3.6–39.8; p-value < 0.001), high knowledge of COVID-19 infection (aOR = 2.6; 95% CI = 1.0–7.4; p-value = 0.044) and high acceptance of government policies (aOR = 4.1; 95% CI = 1.5–11.6; p-value = 0.006) were associated with the application of health protocols post-vaccination in people aged 18 years and over. In the studied group, having access to trusted social media, knowledge, and public acceptance of government policies led to adhering to the recommended health protocols post-vaccination.

Keywords: acceptance, COVID-19, health protocols, knowledge, social media access

Introduction

The pandemic of the coronavirus disease 2019 (COVID-19) is one of the biggest public health problems globally. It is disrupting the health system worldwide, leading to millions of deaths.¹ COVID-19 is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection.² Before the COVID-19 vaccine was developed, the health prevention strategy for preventing COVID-19 infection was the implementation of health protocols. In the post-COVID-19 vaccination era, the health authorities have advised people to continue adhering to the health protocols, particularly those without the COVID-19 vaccination booster.³ This is because the effectiveness of the COVID-19 vaccine decreases from 88% during the first month after complete vaccination to 47% after five months.⁴ Even vaccinated individuals are still at risk of contracting the virus.⁵ Therefore, in the post-vaccination era, the risk of individuals who have received complete vaccination catching COVID-19 must be conveyed to the public because vaccinated individuals tend to change their behavior.⁶ A decrease in adherence to health protocols after vaccination makes individuals

more susceptible to transmitting the COVID-19 virus.⁷

As well as carrying out vaccinations to achieve herd immunity, the health services should remind the public to consistently follow health protocols through health promotion.⁸ Health promotion related to COVID-19 must continue to remind the public to be disciplined in following the health protocols.⁹ Post-vaccination education is very important because if the community considers that health protocols are no longer needed, it will reduce its compliance with the protocols.¹⁰ Education can be provided by health workers because they are the most trusted source of health information.¹⁰ A post-vaccination study proves that individuals who have received the vaccine are less likely to follow the recommendation to keep their distance from others.¹¹ Another study found that after vaccination, 10.6% of respondents did not adhere to wearing masks, 22.4% did not regularly wash their hands, and 43.5% did not socially distance.¹²

Social media tends to be effective for education because it provides interesting information.¹³ A study by the World Health Organization (WHO), United Nations Children's Fund (UNICEF), and Indonesian Ministry of

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Health found that around 54% of respondents use online applications such as WhatsApp, Facebook, Instagram, and Twitter to get information about COVID-19.¹⁴ Social media can have a positive impact on protecting the public from the COVID-19 pandemic.¹⁵ The full impact of social media in preventing COVID-19 infection has not yet been measured.¹⁶ An analysis of the role of social media needs to be done to improve and develop its role in providing education so that people's consistency in following health protocols post-vaccination is maintained.¹⁷ The integrated model developed by Al-Dmour, *et al.*, can be used to measure the impact of social media on public acceptance. It adopts the Health Belief Model (HBM), stating that social media intervention is a strategy to increase knowledge, change behavior, and form a public health protection system against COVID-19.¹⁵

The Primary Health Care (PHC) III in South Denpasar has conducted a health education campaign on preventing COVID-19 using social media such as Instagram, Facebook, and Whatsapp Groups.¹⁸ The campaign aims to promote adherence to the health protocols even after getting a vaccination booster. The educational materials on its social media include health protocols for domestic travelers and hotlines for vaccination, diarrhea due to COVID, implementing balanced nutrition to prevent COVID, and the vaccination procedure for the elderly.¹⁹

Other educational materials produced include "Together against COVID-19," a tutorial on how to download vaccination certificates, information on vaccination for survivors of COVID-19, information on adverse events following immunization (AEFI), a WhatsApp Cares chatbot, information on the COVID-19 Omicron variant, and COVID information for children aged 6–11 years and the elderly.²⁰ It is important to promote community awareness of the spread of COVID-19 and to optimize the community's acceptance of health protocols after having the COVID-19 vaccination booster. Thus, this study aimed to determine the factors influencing adherence to health protocols post-COVID-19 vaccination in people aged 18 years and over in the South Denpasar Subdistrict.

Method

This observational study used a cross-sectional design and was conducted in the PHC III of South Denpasar Subdistrict from July to August 2022. This study employed an incidental sampling from 311,590 people. The South Denpasar Subdistrict is an urban area and one of the most congested areas in Denpasar City, with an area of 4.999 ha or 39.1% of the total. The inclusion criteria for this study were having had a booster vaccination and living in the South Denpasar Subdistrict. The minimum sample of 147 people was calculated using two different

hypothesis tests for the WHO standard proportion with a P1 value (the proportion of people who followed the health program from the previous study) = 10.6%.²¹ The value of P2 (the proportion of people who do not comply with the health program from the previous study) = 23.5%, the study power was 80%, and the alpha value was 0.05.

The study's dependent variable was the acceptance of the health protocols, and the independent variables were the characteristics of the respondents, including age, sex, education, occupation, and COVID vaccination status. Furthermore, the social media access variable included community behavior in accessing social media, Facebook, Instagram, and WhatsApp groups by reading the information provided on such topics as the COVID-19 disease, the 5M health protocol (washing hands, maintaining distance, staying away from crowds, reducing travel, and wearing masks), and COVID-19 vaccination.²² Each respondent's knowledge of COVID-19 disease was measured by 15 questions that included the causes of the disease, modes of transmission, signs and symptoms, risk factors, and efforts to prevent and control COVID-19. The respondent's knowledge was categorized as high for scores more than and equal to 90% correct answers, while scores of less than 90% were categorized as low.

Furthermore, six questions were used to measure the community acceptance of COVID-19 protocols, which consisted of whether the respondent believed that health protocols could prevent the spread of the virus; whether government policies can control COVID-19; whether COVID-19 infection can be prevented by wearing masks, washing hands, and maintaining distance; and whether they accepted government policies related to COVID-19 (implementation of health protocols, testing and tracing policies, and booster vaccinations). The community acceptance was categorized as high and low; "high" when 90% or more of the questions were answered positively and "low" when less than 90% were answered positively.

The study's independent variable was the respondent's compliance with health protocols to prevent COVID-19. Seven questions were used to measure compliance, which included following health protocols, adhering to government recommendations, and participating in community protection efforts. Compliance with health protocols was categorized as good if 90% or more of the questions were answered "yes," and bad if less than 90% were answered "yes." All variables were obtained through interviews with the respondents using a structured questionnaire.

The data were processed using the free version of SPSS 25. Univariate analyses were done to measure the frequency of the characteristics and all variables, e.g., social media access, community knowledge, community ac-

ceptance, and adherence to health protocols. Inferential analysis was used to measure the difference in proportion between the independent and dependent variables. Hypothesis testing was conducted with the Chi-squared method with a 95% confidence interval and multiple logistic regression tests using the backward method to determine the relationship between access to social media, public knowledge, and public acceptance of the government’s health protocols.

Results

The final analysis included 147 respondents. Most respondents were female adults (63.3% female, 76.9% adults), had been to high school (66%), worked as private employees (54.5%), and had had the COVID-19 booster vaccination (75.5%) (Table 1). Less than half of the respondents (46.3%) had sufficient access to social media; most of those used Facebook. Most respondents did not use social media daily, had accessed it in the last six months, enjoyed reading information about COVID-19, practiced the COVID-19 prevention program, had been vaccinated, and provided feedback by liking and sharing information with friends and family. Most respondents (80%) were categorized as having high knowledge regarding the dangers of COVID-19 infection. However, only 34.7% highly accepted the government’s policy for preventing COVID-19. 70.1% followed good health protocols (Table 2).

Table 3 shows the significant proportion differences in following health protocols based on access to social media, public knowledge, and public acceptance. An overwhelming 86.5% of people who accessed social me-

dia related to COVID-19 education, 73.9% who had high knowledge regarding the dangers of COVID-19, and

Table 1. Respondents’ Characteristics (n = 147)

Variable	Category	n (%)
Age (years)	Teenagers (18–20)	32 (21.8)
	Adults (21–60)	113 (76.9)
	Elderly (>60)	2 (1.4)
Sex	Male	54 (36.7)
	Female	93 (63.3)
Education	Elementary school	5 (3.4)
	Junior high school	5 (3.4)
	Senior high school	98 (66.7)
	Higher education	39 (26.5)
Occupation	Civil servant	3 (2.0)
	Private employees	80 (54.4)
	Health workers/cadres	7 (4.8)
	Unemployed	57 (38.8)
COVID-19 vaccination status	Second dose	36 (24.5)
	Third dose (booster)	111 (75.5)

Table 2. Distribution of Social Media Access, Community Knowledge, Community Acceptance, and Adherence to Health Protocols

Variable	Category	n (%)
Social media access	No access	42 (26.8)
	Limited access	68 (46.3)
	Good access	37 (25.2)
Knowledge	Low	28 (19.0)
	High	119 (81.0)
Acceptance	Low	96 (65.3)
	High	51 (34.7)
Adherence to Health Protocols	Bad	44 (29.9)
	Good	103 (70.1)

Table 3. Distribution of Adherence to Health Protocols Based on Community Characteristics, Social Media Access, Knowledge, and Community Acceptance

Variable	Category	Adherence to Post-Vaccination Health Protocols (n, %)		OR	95% CI	p-value
		Bad	Good			
Age (years)	Teenagers (18–20)	8 (25.0)	24 (75.0)	1.367	0.560–3.336	0.491
	Adults (21–60)	36 (31.9)	77 (68.1)	0.658	0.271–1.596	0.352
	Elderly (>60)	0 (0.0)	2 (100.0)	Ref		
Sex	Male	13 (24.1)	41 (75.9)	1.577	0.739–3.366	0.237
	Female	31 (33.3)	62 (66.7)	Ref		
Education	Higher education	12 (30.8)	27 (69.2)	0.947	0.428–2.099	0.894
	Primary and secondary education	32 (29.6)	76 (70.4)	Ref		
Occupation	Employed	28 (31.1)	62 (68.9)	0.864	0.416–1.795	0.695
	Unemployed	16 (28.1)	41 (71.9)	Ref		
	Social media access	Good access	5 (13.5)	56 (86.5)	3.515	1.267–9.752
Knowledge	Some access	12 (17.6)	56 (82.4)	3.177	1.473–6.852	0.003*
	No access	27 (64.3)	15 (35.7)	Ref		
	High	31 (26.1)	88 (73.9)	2.460	1.054–5.745	0.034*
Acceptance	Low	13 (46.4)	14 (53.6)	Ref		
	High	7 (13.7)	44 (86.3)	3.942	1.607–9.669	0.002*
	Low	37 (38.5)	59 (61.5)	Ref		

Notes: * = significant p-value<0.05, OR = Odd Ratio, CI = Confidence Interval

Table 4. Relationship between Social Media Access, Knowledge, and Community Acceptance of Health Protocols

Variable	Category	aOR	95% CI	p-value
Social media access	Good access	11.983	3.601–39.873	0.000*
	Some access	8.624	3.360–22.153	0.000*
	No access	Ref		
Knowledge	High	2.699	1.084–7.402	0.044*
	Low	Ref		
Acceptance	High	4.193	1.505–11.682	0.006*
	Low	Ref		

Notes: * = significant p-value<0.05, OR = Odd Ratio, CI = Confidence Interval

86.3% who had high acceptance of policies for the prevention and control of the COVID-19 pandemic properly followed the COVID-19 health protocols. Multivariate analysis showed that people accessing COVID-19 educational posts on social media tended to be 11 times better at following health protocols (aOR=11.9; 95% CI = 3.6–39.8; p-value<0.001). Communities with high knowledge regarding the dangers of COVID-19 also tended to be two times better at following health protocols (aOR = 2.6; 95% CI = 1.0–7.4; p-value = 0.044). Also, communities with high acceptance of government policies and regulations tended to be four times better at following health protocols (aOR = 4.1; 95% CI = 1.5–11.6; p-value = 0.006).

Discussion

This study determined the factors related to following health protocols after receiving the COVID-19 vaccination booster in people aged 18 years and over in the South Denpasar Subdistrict. The factors studied included the sociodemographic characteristics of the community, access to social media, knowledge, and community acceptance.²³ This study showed that people who access COVID-19 educational posts on social media tend to be 11 times better at adhering to health protocols. People who had high knowledge regarding the dangers of COVID-19 and high acceptance of government policies and efforts to prevent and control COVID-19 were 2.6 and 4 times better at following health protocols, respectively.

These results can be explained by the integrated conceptual model used by Al-Dmour, *et al.*, which adopts the HBM theory combined with the influence of social media.¹⁵ This model states that social media can affect knowledge and community behavior in adhering to COVID-19 prevention health protocols.²⁶ More specifically, the conceptual model explains the benefits of social media in COVID-19 health promotion efforts and increasing protection against pandemic diseases by disseminating information on public health interventions, in-

creasing public knowledge, promoting healthy behavior, and increasing the amount of health information available to the public.²⁷

In the HBM model, knowledge is one of the cue components to act. The community’s knowledge and adherence to health protocols can appropriately protect themselves and their families from the threat of COVID-19.²⁸ The behavior of people who are ignorant of implementing post-vaccination health protocols is often triggered by the re-spread of COVID-19.²⁹ Knowledge is one of the factors that contribute to community discipline in following health protocols to slow the spread of COVID-19.³⁰ One aspect that influences people to follow the health protocols is widespread public acceptance of the policies and programs implemented by the government to tackle the COVID-19 pandemic.³¹ This study explained that the HBM components, including perceived benefits, perceived barriers, self-efficacy, and cues to action, influence adherence to the COVID-19 health protocols. Communities who find the COVID-19 health protocols useful, feel threatened by the disease, have good self-efficacy, and have the ability to apply positive behavior through given cues are better at following the COVID-19 health protocols.³²

During the pandemic, social media was used as the main source of COVID-19 information. In this study, most of the respondents used Facebook as their primary social media account, as most of the participants in this study were adults, and they were more likely to use this platform. These results can be used as evidence to improve the use of Facebook as a platform for health promotion efforts, especially education regarding the application of health protocols and vaccination programs.³³ During the COVID-19 pandemic, social media functioned optimally to change people’s behavior, especially in adapting to new habits.³⁴

Most respondents in this study were adults aged 21–60 years. This study used WHO standards by dividing age ranges into three groups: adolescents (18–20 years), adults (21–60 years), and the elderly (60+ years).³⁵ Most

respondents were female. These results showed that female individuals were more actively involved in sharing information on implementing the COVID-19 health protocols.

In terms of education, most respondents went to senior high school. Education is the dominant factor influencing one's knowledge.³⁶ People with higher education tend to be able to respond more rationally to the information they receive and think about the extent of the benefits they will get.³⁷ In addition, job status tends to be closely related to education.³⁸ More than half of the respondents in this study were employed. However, there were also quite a lot of unemployed people, most of whom were housewives. Notoatmodjo explained that the higher a person's education, the better the job that person is likely to receive.³⁹ The main limitation of this study was the data collection process. Data retrieval was usually carried out in the same period of the afternoon and evening, so the respondents found tended to be individuals of mature age, especially housewives. This reduced the variety in the obtained sample and made it difficult to generalize the study results to the total population.

Conclusion

In the post-COVID-19 era, it is still necessary to continue encouraging adherence to health protocols to prevent COVID-19 transmission. Adherence to health protocols after having the COVID-19 vaccination booster is related to good social media access, high knowledge of the threat of COVID-19 to health, and community acceptance. Optimal use of social media such as Facebook as a health promotion platform is suggested to encourage people to adhere to prevention protocols as directed by the health authorities.

Abbreviations

WHO: World Health Organization; COVID-19: coronavirus disease 2019; SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus-2; HBM: Health Belief Model.

Ethics Approval and Consent to Participate

Ethical approval was obtained from the Health Research Ethics Commission of the Faculty of Medicine, Udayana University, No. 1974/UN14.2.2.VII.14/LT/2022.

Competing Interest

The authors declare that there are no significant competing financial, professional, or personal interests that might have affected the performance or presentation of the work described in this manuscript.

Availability of Data and Materials

The dataset and materials are available to share upon a reasonable request to the corresponding author.

Authors' Contribution

NLGA designed the studies, developed methodologies and data collection tools, conducted data analysis, and compiled manuscripts. DSL gave insight into all research steps and critically revised the manuscripts. NPW gave insight into all aspects of the research. All authors have approved the final manuscript.

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