Community Knowledge, Attitudes and Behaviors towards Obesity Prone to COVID-19 Infection

Ayu Saka Laksmita W*, Desak Putu Risky Vidika Apriyanthi, and Ni Putu Widayanti
Faculty of Health Science, Universitas Bali Internasional, Indonesia
*corresponding author: sakalaksmita@gmail.com

ARTICLE INFO

ABSTRACT

Background: The COVID-19 pandemic is an infectious disease that has spread worldwide. Prevention of COVID-19 can be suppressed with a good level of knowledge and positive attitudes and behaviors. The community needs to play a role in breaking the chain of transmission of COVID-19 by implementing health protocols. The purpose of this study was to determine the relationship between the level of public knowledge about COVID-19 and the attitudes and behavior of the people of Denpasar City towards obesity, which are more susceptible to infection with COVID-19. Method: This type of non-experimental research with correlational design and cross-sectional design. The number of samples in this study was 400 respondents using simple random sampling. Data collection uses a questionnaire via WhatsApp with a google form. Results: The results showed that there was a relationship between public knowledge about COVID-19 and the attitudes and behavior of the people of Denpasar City towards obesity being more susceptible to infection with COVID-19 with $p = 0.000$ and $r = 0.307$ for attitudes and $p = 0.000$ and $r = 0.408$ for behavior. Conclusion: A strong correlation between the variable level of knowledge and attitudes and behavior and the direction of the relationship is positive, which means the better the level of knowledge, the better the attitude and behavior of the community to prevent contracting COVID-19.

Introduction

Coronavirus disease 2019 (COVID-19) is an infectious disease that has spread worldwide. COVID-19 is caused by acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and was discovered in early December 2019 in Wuhan, Hubei province, China [1]. WHO states that the coronavirus disease 2019 (COVID-19) is a global pandemic disease that has spread to various countries [2]. Indonesia has experienced non-natural disasters due to the Coronavirus or COVID-19 since the beginning of 2020. The coverage of areas infected with COVID-19 has expanded and has affected all aspects of life, such as socio-economic as well as health problems for mothers and children. However, efforts to reduce maternal and neonatal morbidity and mortality must still be a concern amid the spread of COVID-19 cases [3].

The incidence of COVID-19 in the world continues to increase every day. Based on data from the World Health Organization for January 12, 2021, there were 88,387,352 confirmed cases and 1,919,204 deaths. The United States is the country with the most confirmed positive cases of COVID-

19 with a total of 38,861,668 and 910,741 deaths [4]. Indonesia until January 17 2021 the number of positive confirmed COVID-19 was 907,929 and the number who died was 25,987. The Province of Bali has 21,444 positive confirmed cases of COVID-19 and 59 deaths [5]. Data for COVID-19 in Denpasar City were 5,904 confirmed positive and the number who died was 121. Cases that occurred in the North Denpasar sub-district 454 [6].

The rapid spread and exponentially increasing a number of cases resulted in the importance of outreach and education on the prevention and control of the spread of this infectious disease. Prevention strategies are more focused on isolation, controlling the spread of infection, and diagnosing and treating COVID-19 patients. WHO recommends keeping your distance, and washing your hands with running water and soap. Until now, the COVID-19 situation at the global and national levels is still at very high risk. As long as vaccine development is still in progress, the world is faced with the reality of preparing to coexist with COVID-19. Research conducted at the University of Indonesia, states that non-health students have a poor level of health literacy compared to health students [7]. Knowledge is needed in preventing new virus outbreaks or zoonoses. However, the results of a survey conducted by researchers from the Indonesian Institute of Sciences (LIPI), stated that the knowledge possessed by people in Indonesia regarding diseases that are transmitted by animals to humans or /zoonosis is still minimal/low [8].

Good knowledge of adolescents about COVID-19 is very important for adolescents so that it does not cause an increase in the number of COVID-19 cases. As many as 30.65% had poor knowledge about COVID-19. A survey conducted by UNICEF of 4,000 youth related to COVID-19 showed that there were still youths (25%) who had insufficient knowledge about COVID-19 [9]. Good knowledge about COVID-19, health protocols, and prevention of transmission of COVID-19 will give birth to a positive attitude toward behavior to prevent transmission of COVID-19. A positive attitude will also produce good behavior to prevent the transmission of COVID-19. Good knowledge will certainly bring good attitudes, and vice versa [10]. Therefore, this study aimed to see the relationship between knowledge about COVID-19 and the attitudes and behavior of the people of Denpasar City toward obesity, which are more susceptible to being infected with COVID-19.

Materials and Method

This research was a non-experimental research type with a correlational design [11]. The research was conducted from February to April 2022. Respondents used the Denpasar city community with a total of 400 respondents. The questionnaires were given each contained 10 questions to assess the level of knowledge of the Denpasar community about obesity which is more susceptible to COVID-19 infection. The distribution of this questionnaire was carried out in February-April 2022. In distributing questionnaires, the authors used applications such as Line, Whatsapp, and Instagram with the help of relatives. The questionnaire presented is an electronic questionnaire in the form of a google form that can be accessed online via the link provided. Data from all samples will be entered into the computer by the author. The sampling technique used is simple random sampling. Bivariate analysis was carried out to analyze the relationship between the level of knowledge and the attitude of the Denpasar city community and to analyze the relationship between knowledge and behavior of the Denpasar city community towards obesity and being more susceptible to COVID-19 infection. Bivariate analysis using the spearman rank test [12].

Results and Discussion

Results

Table 1 shows that out of 400 respondents, the level of good knowledge with poor attitude is 1 (0.3%), the level of knowledge is sufficient with less as many as 5 (1.3%), the level of knowledge is less with less attitude as many as 7 (1.8%). The level of good knowledge with a moderate attitude was 48 (12%), the level of moderate knowledge with a moderate attitude was 14 (3.5%), and no level of knowledge was found with a moderate attitude. While the level of good knowledge with a good attitude was 292 (73%), the level of knowledge was sufficient with a good attitude as many as 33 (8.3%), and no level of knowledge was found with a lack of attitude. The results of bivariate analysis using the Spearman rank test obtained a p-value of 0.00 smaller than 0.05, meaning that

there is a relationship between the level of community knowledge and community attitudes. The strength of the correlation is seen from the r-value, which is 0.37. This value shows a strong correlation between the variable level of knowledge of COVID-19 and the attitude of the people of Denpasar city towards obesity which is more vulnerable to COVID-19 infection. The correlation coefficient value is positive, indicating that the better the level of knowledge of the Denpasar city community about COVID-19 is more susceptible to infecting people classified as obese, the better the attitude of the Denpasar city community towards obesity is more susceptible to being infected with COVID-19.

Table 1. Bivariate Analysis of the Knowledge and Attitude towards Obesity More Prone to COVID-19

Knowledge Levels	Attitude								r	P	95% CI
	Less		Sufficient		Good		Total				
	n	%	n	%	n	%	n	%			
Good	1	0.3	48	12	292	73	341	85.5			
Sufficient	5	1.3	14	3.5	33	8.3	52	13.0	0.307	0.00	-0.423-0.190
Less	7	1.8	0	0.0	0	0.0	7	1.8			

Table 2 shows that out of 400 respondents, the level of good knowledge with poor attitude is 1 (0.3%), the level of knowledge is sufficient with less as many as 5 (1.3%), the level of knowledge is less with less attitude as many as 7 (1.8%). The level of good knowledge with a moderate attitude was 48 (12%), the level of moderate knowledge with a moderate attitude was 14 (3.5%), and no level of knowledge was found with a moderate attitude. While the level of good knowledge with a good attitude was 292 (73%), the level of knowledge was sufficient with a good attitude as many as 33 (8.3%), and no level of knowledge was found with a lack of attitude. The results of bivariate analysis using the Spearman rank test obtained a p-value of 0.00 smaller than 0.05, meaning that there is a relationship between the level of community knowledge and community attitudes. The strength of the correlation is seen from the r-value, which is 0.37. This value shows a strong correlation between the variable level of knowledge of COVID-19 and the attitude of the people of Denpasar city towards obesity which is more vulnerable to COVID-19 infection. The correlation coefficient value is positive, indicating that the better the level of knowledge of the Denpasar city community about COVID-19 is more susceptible to infecting people classified as obese, the better the attitude of the Denpasar city community towards obesity is more susceptible to being infected with COVID-19.

Table 2. Bivariate Analysis of the Knowledge and Behavior of Obesity More Prone to COVID-19

Knowledge Levels	Behavior								r	P	95%CI
	Less		Sufficient		Good		Total				
	n	%	n	%	n	%	n	%			
Good	6	1.5	74	18.5	261	65.3	341	85.3			
Sufficient	4	1.0	32	8.0	16	4.0	52	13.0	0.408	0.00	-0.487-0.290
Less	7	1.8	0	0.0	0	0.0	7	1.8			

Discussion

Knowledge is the result of the senses possessed by adolescents and the result of knowing a certain object. At the time of sense by itself, it will make knowledge affect the power of judgment and impressions of the object. Adolescent knowledge is largely influenced by the sense of sight and sense of hearing [13]. Several components affect the level of knowledge such as education, age, information/mass media, and experience. Information about COVID-19 can be obtained by adolescents through social media, the internet, television, the ministry of health, WHO, and information from peers [14, 21-22].

Currently, many efforts to prevent COVID-19 have been carried out by the government. One of the strategies for controlling COVID-19 is to slow down and stop the rate of transmission of disease transmission with the main elements being community involvement and support [23]. The people of Denpasar city may be vulnerable to infection with COVID-19 due to the dense population and activities of the population, most of whom are office workers, which will result in obesity, making

them susceptible to disease, especially the transmission of COVID-19 infection. This requires a strong level of knowledge about how to avoid the current COVID-19 infection. The results of the study showed that there was a correlation between the level of knowledge of COVID-19 and the attitudes and behavior of the people of Denpasar City towards obesity, which are more susceptible to being infected with COVID-19. Knowledge is built from data, information, and prior knowledge [15]. This is also in line with the statement that someone who has good knowledge about COVID-19 will also have a positive attitude and proactive behavior in dealing with the COVID-19 outbreak [16].

Knowledge about COVID-19 disease is very important to shape a person's behavior in helping reduce and prevent the risk of spreading COVID-19. Therefore elementary school-age students need to be given an understanding of the basic knowledge of COVID-19 [17]. If someone has knowledge and information about COVID-19, it is hoped that he will be able to determine how he should behave to deal with the COVID-19 pandemic. The results of the bivariate analysis using the Spearman rank test obtained a p-value of 0.00 less than 0.05, meaning that there is a relationship between the level of public knowledge and the attitude of the community. The strong and low correlation can be seen from the value of r, which is 0.37. This value shows a strong correlation between the variable level of knowledge of COVID-19 and the attitude of the people of Denpasar city towards obesity, which is more susceptible to being infected with COVID-19. The value of the correlation coefficient is positive, indicating that the better the knowledge level of the people of Denpasar City about COVID-19, the more susceptible it is to infect people who are classified as obese, the better the attitude of the people of Denpasar City towards obesity is, the more susceptible they are to be infected with COVID-19. The higher a person's knowledge about COVID-19, it is hoped that the better the person will be at making decisions and determining actions in dealing with the COVID-19 outbreak. Attitude is an individual response to a stimulus [24]. So that the attitude of the people of Denpasar City in this study can be interpreted as the community's response to the incident of COVID-19. Several components affect attitudes such as mass media, personal experience, culture, the influence of other people, religion, educational institutions, and emotion [18, 25-26].

The results of the bivariate analysis using the Spearman rank test obtained a p-value of 0.00 less than 0.05, meaning that there is a relationship between the level of public knowledge and people's behavior. The strength of the correlation is seen from the value of r, which is 0.408. This value shows a strong correlation between the variable level of knowledge of COVID-19 and the behavior of the people of Denpasar city towards obesity, which is more susceptible to being infected with COVID-19. The value of the correlation coefficient is positive, indicating that the better the knowledge level of the people of Denpasar City about COVID-19, the more susceptible it is to infect people who are classified as obese, the better the behavior of the people of Denpasar City towards obesity, the more susceptible they are to be infected with COVID-19. The results of this study are in line with a research entitled Knowledge with Attitudes to Prevent COVID-19 in the people of North Sulawesi showing that there is a relationship between knowledge and attitudes to prevent COVID-19 in the people of North Sulawesi with a value of p=0.000 [19,27]. This is also in line with previous studies which said that people who have good knowledge will also have good attitudes and behavior [28,29]. Efforts to prevent COVID-19 are influenced by the knowledge of the Indonesian people. The provision of specific, valid, and targeted knowledge can improve community prevention behavior against COVID-19 infection [20,30].

Conclusion

From the discussion above, it can be concluded that there is a strong correlation between the level of knowledge of COVID-19 and the attitudes and behavior of the people of Denpasar City towards obesity which is more susceptible to COVID-19 infection, which means that the better the level of knowledge, the better the attitude and behavior of the community to prevent contracting COVID-19. In-depth counseling is needed for the people of Denpasar City about healthy food intake and the early risk of COVID-19 transmission.

Declaration

Conflicts of Interest: No conflict of interest.

References

1. Gao, Z., Xu, Y., Sun, C., Wang, X., Guo, Y., Qiu, S. & Ma, K. A Systematic Review of Asymptomatic Infections with COVID-19. *Journal of Microbiology, Immunology and Infection*. 2021; 54(1): 12–16. https://doi.org/10.1016/j.jmii.2020.05.001.

2. Baig, A.M., Khaleeq, A., Ali, U. & Syeda, H. Evidence of the COVID-19 Virus Targeting the CNS: Tissue Distribution, Host-Virus Interaction, and Proposed Neurotropic Mechanisms. *ACS Chemical Neuroscience*. 2020. 11(7): 995–998. Doi: https://doi.org/10.1021/acschemneuro.0c00122

3. Pavlidis P, Eddy K, Phung L, Farrington E, Connolly M, Lopes R, Wilson AN, Homer CSE, Vogel JP. Clinical Guidelines for Caring for Women with COVID-19 During Pregnancy, Childbirth and the Immediate Postpartum Period. *Women Birth*. 2021 Sep;34(5):455-464. doi: 10.1016/j.wombi.2020.10.015.

4. Jamieson DJ, Rasmussen SA. An Update on COVID-19 and Pregnancy. *Am J Obstet Gynecol*. 2022 Feb;226(2):177-186. doi: 10.1016/j.ajog.2021.08.054.

5. Roshchina Y, Roshchin S, Rozhkova K. Determinants of COVID-19 Vaccine Hesitancy and Resistance in Russia. *Vaccine*. 2022 Sep 16;40(39):5739-5747. doi: 10.1016/j.vaccine.2022.08.042.

6. Haque A, Pant AB. Mitigating Covid-19 in the Face of Emerging Virus Variants, Breakthrough Infections and Vaccine Hesitancy. *J Autoimmun*. 2022 Feb;127:102792. doi: 10.1016/j.jaut.2021.102792.

7. Lestari P, Handiyani H. The Higher Level of Health Literacy Among Health Students Compared with Non-Health Students. *UI Proc Heal*. 2019;1:1–5. Doi: https://doi.org/10.37506/ijfmt.v14i4.12275

8. Umakanthan S, Sahu P, Ranade AV, Bukelo MM, Rao JS, Abrahao-Machado LF, Dahal S, Kumar H, Kv D. Origin, Transmission, Diagnosis and Management of Coronavirus Disease 2019 (COVID-19). *Postgrad Med J*. 2020 Dec;96(1142):753-758. doi: 10.1136/postgradmedj-2020-138234.

9. Seedat S, Chemaitelly H, Ayoub HH, Makhoul M, Mumtaz GR, Al Kanaani Z, Al Khal A, Al Kuwari E, Butt AA, Coyle P, Jeremijenko A, Kaleeckal AH, Latif AN, Shaik RM, Yassine HM, Al Kuwari MG, Al Romaihi HE, Al-Thani MH, Bertollini R, Abu-Raddad LJ. SARS-CoV-2 Infection Hospitalization, Severity, Criticality, and Fatality Rates in Qatar. Sci Rep. 2021 Sep 14;11(1):18182. doi: 10.1038/s41598-021-97606-8.

10. Al-Dossary R, Alamri M, Albaqawi H, Al Hosis K, Aljeldah M, Aljohan M, Aljohani K, Almadani N, Alrasheadi B, Falatah R, Almazan J. Awareness, Attitudes, Prevention, and Perceptions of COVID-19 Outbreak among Nurses in Saudi Arabia. *Int J Environ Res Public Health*. 2020 Nov 9;17(21):8269. doi: 10.3390/ijerph17218269.

11. Brockopp DY. Nursing Research: A Conundrum. *J Nurs Adm*. 2018 May;48(5):231-232. doi: 10.1097/NNA.0000000000000605.

12. Story DA, Tait AR. *Survey Research. Anesthesiology*. 2019 Feb;130(2):192-202. doi: 10.1097/ALN.0000000000002436.

13. Salameh BS, Basha S, Abdallah J, Basha W. Early Perception, Behavior, Knowledge, and Preventive Practices Related to COVID-19 among Palestinians. *Glob Health Promot*. 2022 Mar;29(1):33-43. doi: 10.1177/17579759211035092.

14. Puspitasari IM, Yusuf L, Sinuraya RK, Abdulah R, Koyama H. Knowledge , Attitude , and Practice During the COVID-19 Pandemic : A Review. *Jurnal of Health,Medicine and Nursing* 2020 Dec; doi: https://doi.org/10.7176/jhmn/84-01

15. Bolisani, E. & Bratianu, C. The Elusive Definition of Knowledge. 2018. Doi: https://doi.org/10.1007/978-3-319-60657-6_1

16. Peng, Y., Pei, C., Zheng, Y., Wang, J., Zhang, K., Zheng, Z. & Zhu, P. A Cross-Sectional Survey of Knowledge, Attitude and Practice Associated with COVID-19 Among Undergraduate Students in China. *BMC Public Health*. 2020. 20(1): 1–24. Doi: https://doi.org/10.21203/rs.3.rs-21185/v2

17. Juin JCY, Ern SLS, Min CEHS, Jing NK, Qi MNM, Hoe RCC, Ling TCX, Yi FFJ, Germain GSL, Venkatesh KNS, Ying SZ, Shen ZCY, Shayne P, Wei LX, Cherie OYQ, Wu B, Xuan LYY, Rong TN, Hui CNZ, Wen SW, Yichong BS, Man RWS, Tan S, Leong I, Li-Lynn CC, Wen TJ, Junxiong P. Knowledge, Attitudes, and Practices of COVID-19 Vaccination among Adults in Singapore: A Cross-Sectional Study. *Am J Trop Med Hyg*. 2022 Jul 18;107(3):540–50. doi: 10.4269/ajtmh.21-1259.

18. Payongayong JV, Thomas-Hawkins C, Jarrín OF, Barberio J, Hain DJ. Effects of End-of-Life Communication Knowledge, Attitudes, and Perceived Behavioral Control on End-of-Life Communication Behaviors Among Nephrology Nurse Practitioners. *Nephrol Nurs J*. 2022 May-Jun;49(3):213-225. Doi: https://doi.org/10.37526/1526-744x.2022.49.3.213

19. Hong J, Xu XW, Yang J, Zheng J, Dai SM, Zhou J, Zhang QM, Ruan Y, Ling CQ. Knowledge About, Attitude and Acceptance Towards, and Predictors of Intention to Receive the COVID-19 Vaccine among Cancer Patients in Eastern China: A Cross-Sectional Survey. *J Integr Med*. 2022 Jan;20(1):34-44. doi: 10.1016/j.joim.2021.10.004.

20. Sharma A, Ahmad Farouk I, Lal SK. COVID-19: A Review on the Novel Coronavirus Disease Evolution, Transmission, Detection, Control and Prevention. *Viruses*. 2021 Jan 29;13(2):202. doi: 10.3390/v13020202

21. Mohmmed HA, Alawad RA, Awad AK, Alobied AA. Knowledge, Attitude, and Acceptance Regarding COVID-19 Vaccines in Sudan. *Front Public Health*. 2022 Oct 10;10:954810. doi: 10.3389/fpubh.2022.954810

22. Davis TC, Curtis LM, Wolf MS, Vanchiere JA, Bhuiyan MAN, Horswell R, Batio S, Arnold CL. COVID-19 Knowledge, Beliefs, and Behavior Among Patients in a Safety-Net Health System. *J Community Health*. 2022 Jun;47(3):437-445. doi: 10.1007/s10900-021-01059-z

23. Kumari A, Ranjan P, Chopra S, Kaur D, Upadhyay AD, Kaur T, Bhattacharyya A, Arora M, Gupta H, Thrinath A, Prakash B, Vikram NK. Development and Validation of A Questionnaire to Assess Knowledge, Attitude, Practices, and Concerns Regarding COVID-19 Vaccination Among the General Population. *Diabetes Metab Syndr*. 2021 May-Jun;15(3):919-925. doi: 10.1016/j.dsx.2021.04.004

24. Luo YF, Chen LC, Yang SC, Hong S. Knowledge, Attitude, and Practice (KAP) toward COVID-19 Pandemic among the Public in Taiwan: A Cross-Sectional Study. *Int J Environ Res Public Health*. 2022 Feb 27;19(5):2784. doi: 10.3390/ijerph19052784.

25. Cheng HC, Chang YJ, Liao SR, Siewchaisakul P, Chen SL. The impact of COVID-19 on Knowledge, Attitude, and Infection Control Behaviors Among Dentists. *BMC Oral Health*. 2021 Nov 19;21(1):584. doi: 10.1186/s12903-021-01946-w

26. Mahmood S, Hussain T, Mahmood F, Ahmad M, Majeed A, Beg BM, Areej S. Attitude, Perception, and Knowledge of COVID-19 Among General Public in Pakistan. *Front Public Health*. 2020 Dec 9;8:602434. doi: 10.3389/fpubh.2020.602434.

27. Zaheer U, Shahbaz M, Zaheer N, Israr J, Riaz A, Yaqub A, Alam MK. Knowledge, Attitude, and Behaviour of Dentists Working during the COVID-19 Pandemic: A Cross-Sectional Survey. *Work.* 2022;72(4):1153-1161. doi: 10.3233/WOR-211018.

28. Adli I, Widyahening IS, Lazarus G, Phowira J, Baihaqi LA, Ariffandi B, Putera AM, Nugraha D, Gamalliel N, Findyartini A. Knowledge, Attitude, and Practice Related to the COVID-19 Pandemic Among Undergraduate Medical Students in Indonesia: A Nationwide Cross-Sectional Study. *PLoS One.* 2022 Jan 21;17(1):e0262827. doi: 10.1371/journal.pone.0262827.

29. Rahman MM, Marzo RR, Chowdhury S, Qalati SA, Hasan MN, Paul GK, Abid K, Sheferaw WE, Mariadass A, Chandran D, Kanan S, Firdaus AUSBA, Sabarin FAZB, Lin Y. Knowledge, Attitude and Practices Toward Coronavirus Disease (COVID-19) in Southeast and South Asia: A Mixed Study Design Approach. *Front Public Health*. 2022 Jun 21;10:875727. doi: 10.3389/fpubh.2022.875727.

30. Di Giuseppe G, Pelullo CP, Lanzano R, Napolitano F, Pavia M. Knowledge, Attitudes, and Behavior of Incarcerated People Regarding COVID-19 and Related Vaccination: A Survey in Italy. *Sci Rep*. 2022 Jan 19;12(1):960. doi: 10.1038/s41598-022-04919-3.