Original Article

Improvement in knowledge and perception about the controlling of COVID-19: best practice of apothecary student

Chynthia Pradiftha Sari[1*], Suci Hanifah[1], Yulianto[1], Dian Medisa[2], Zahrotun Nafiah[2], Muhammad Alfian Lutfi[2]

[1]Department of Pharmacy, University of Islam Indonesia, Yogyakarta, Indonesia. [2]Department of Apothecary Program, University of Islam Indonesia, Yogyakarta, Indonesia.

Correspondence: Chynthia Pradiftha Sari, Department of Pharmacy, University of Islam Indonesia, Yogyakarta, Indonesia. pradiftha@uii.ac.id

ABSTRACT

Coronavirus disease 2019 (COVID-19) has been admitted by WHO as a global pandemic. The successes-ness in controlling COVID-19 is extremely affected by the knowledge and perception of society. Apothecary students must be competent in carrying out the health promotion effort; one of them is through education. Discovering the impact of education from apothecary students in improving knowledge and perception of the society in controlling COVID-19. One group Quasi-experimental design without a control group (n=102). The data was conducted in March-April 2020 using a validated questionnaire containing the respondents' demographic, knowledge, and perception of COVID-19. This research is ≥ 18 years old, does not work as a health worker/medical personnel, domiciled in Yogyakarta, and fills up the pre-test and post-test questionnaire. The data were analyzed descriptively and used the Wilcoxon test ($p<0.05$) as the statistic test. Most respondents are 52.9% women, 34.31% aged 36-45, with 52.94 % having a high school education level. The survey result shows that 71.57% of respondents admit that they know about COVID-19 from television and 2.43% from social media. The answer distribution of questioner on knowledge and perception shows improvements in the pre-test and post-test scores. The Wilcoxon test result, the influence of education on respondents' knowledge and perception, shows the significance of p value=0.000 with the outcome of pre-test and post-test scores with the good category are 67.65% and 5.29%. The presentation of education from apothecary students significantly influences society's knowledge and perception of controlling COVID-19.

Keywords: Perception, Knowledge, Education, Apothecary, COVID-19

Introduction

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by a new type of Novel coronavirus (2019-nCoV) and was firstly aroused in Wuhan, China, in December 2019. The first time COVID-19 was declared a pandemic by WHO (World Health Organization) in March 2020 was because it has become an epidemic in almost every country in the world [1]. The COVID-19 cases by March 31, 2020, from 204 countries that have reported the case, reached 786.228 with a total of patients dying 37.820 and recovered 166.041. In Indonesia, the reported absolute case by March 2020 has 1.414 cases, with actual patients who died 122 and recovered 75 [2]. By the time this research is conducted, the latest data shows that Indonesia's issues have reached 896.642, and 16.354 cases were in Yogyakarta [3]. The significant case improvement from countries that have reported its case, including Indonesia, requires an active role from various health workers to promote the countermeasure of COVID-19 virulence in every region of Indonesia.

As health workers, pharmacists have a role in fulfilling the availability of drugs in the community and hospitals [4]. In a multidisciplinary manner, pharmacists and other health workers must optimize health services to reduce mortality and control the pandemic [5, 6], ensure the treatment's safety, and promote control of COVID-19 transmission in the community [7]. One of the apothecary responsibilities in promoting health, especially in controlling COVID-19, is to present information and education

Access this article online	
Website: www.japer.in	**E-ISSN:** 2249-3379

How to cite this article: Sari CP, Hanifah S, Yulianto, Medisa D, Nafiah Z, Lutfi MA. Improvement in knowledge and perception about the controlling of COVID-19: best practice of apothecary student. J Adv Pharm Educ Res. 2023;13(2):6-11. https://doi.org/10.51847/jN8OIfMTdi

to the community [8]. The correct and sustainable information and education are expected to improve society's obedience in controlling the spread of COVID-19 [9].

Apothecary students are prospective health workers who must meet the predetermined minimum competencies. One of its learning objectives is designing and conducting health promotion to improve society's life degree. The pandemic situation that significantly impacts every society line encourages the apothecary student to develop health promotion programs. The result of the need assessment, reveals that most communities have a misconception about COVID-19. This leads to the importance of an education program that can straighten the community's knowledge and perception of the COVID-19 pandemic. The success-ness in controlling COVID-19 is affected by perception, knowledge, perception, and society's behavior in facing the pandemic [9].

Good knowledge is positively correlated with changes in people's attitudes, such as compliance with washing hands, wearing masks, applying cough and sneezing ethics, avoiding direct contact with livestock, avoiding close contact with anyone showing coughing symptoms sneezing [10]. Regular education and training programs are needed to increase knowledge attitudes and practices toward hand hygiene [11]. This research aims to determine the influence of education from apothecary students toward improving the knowledge and perception of Yogyakarta, Indonesia, in controlling COVID-19.

Materials and Methods

This study used a quasi-experimental method with a quasi-experimental time-series design from March to April 2020 in Ngaglik District, Sleman, Yogyakarta. The research has passed ethical permission from the Faculty of Medicine, the Islamic University of Indonesia, in 2020. Data collection was carried out by distributing pre-test and post-test questionnaires to 102 respondents without a control group. The experimental inclusion criteria represent men and women, aged at least 18 years, who agree to sign informed consent, do not work as health / medical personnel, and live in the Special Region of Yogyakarta. Respondents who did not fill out the pre-test and post-test questionnaires were excluded from this study.

The questionnaire has passed the content validation test by two clinical pharmacists and a community and reliability test using 30 people outside the research respondents. The research questionnaire questions are divided into four: demographic characteristics of the respondent, their current condition, their knowledge, and perception of COVID-19. The demographic data of respondents consist of gender, age, education, job, and income. The pre-test and post-test questionnaire to measure the respondent's knowledge related to COVID-19 consists of ten questions with "right" or "wrong" answers. Knowledge scores were categorized as good (76-100), moderate (55-75), and less (<55). Meanwhile, a questionnaire on the perception of the respondent of the prevention of COVID-19 consists of ten questions with "very agree", "agree", "disagree", and "very disagree". The perception is in the category of Positive with a score of 80-100 and Negative <80.

The researcher collected the questionnaire data door to door by implementing health protocols: keeping a distance of 1-2 meters away from the respondent, wearing a mask, washing hands, and did not have physical contact in any form. In the first week, 102 respondents were provided with a pre-test questionnaire and then were given intervention in the form of an educative video about controlling COVID-19 arranged by the researcher team with 8-10 minutes duration. Then, in the second week, the researcher gave the post-test questionnaire to the respondents to measure the influence of the educative videos on the respondent's knowledge and perception.

Analysis of research used the Science Statistics Package (SPSS) version 21 with the Wilcoxon test ($p < 0.05$) to measure changes in the pre-test and post-test values on data that were not normally distributed. Demographic data of respondents are presented descriptively in the form of proportions.

Results and Discussion

This research was conducted in Ngaglik, Sleman, Yogyakarta, Indonesia, by involving 102 respondents from March to April 2020. From the result of data collection, the number of female respondents is 52.94% greater than males. Most respondents (34.3%) were in an age range around 36-45 years old with the most level of education in high school as much as 52.94%. 40.20% of respondents work as entrepreneurs, of which 24.51% of respondents have an average income of around IDR 1.000.000-2.000.000. The primary source of information in society is 71.57% television and 28.43% from social media.

Table 1 shows the result percentage of pretest-posttest answered by the respondents in which 10 questions were related to the respondents' knowledge of facing the COVID-19 pandemic. The overall percentage shows that the respondents' right answers after the post-test had improved after being given the education intervention.

Table 1. Distribution of Respondent's Knowledge toward COVID-19

No	Statement	Percentage (N=102)				Δ pre-post test
		Pre-test		Post-test		
		T (%)	F (%)	T (%)	F (%)	
1	COVID-19 is caused by bacteria	47.06	52.94	80.39	19.61	33.33
2	COVID-19 was firstly identified in Arab	73.53	26.47	86.27	13.73	12.74
3	Coughing and asphyxiate are one of the characteristics of COVID-19	86.27	13.73	99.02	0.98	12.75
4	Traveling to an infected region has a risk to get infected with COVID-19	93.10	6.90	100.0	0	6.9

5	Vaccine for COVID-19 has existed	54.90	45.10	82.35	17.65	27.45
6	COVID-19 can be prevented/recovered when the immune system is getting better	85.29	14.71	95.10	4.90	9.81
7	Washing hands regularly with soap/antiseptic can prevent the transmission of COVID-19	95.09	4.91	99.02	0.98	3.93
8	Staying at home and do not travel anywhere for unimportant matters can prevent COVID-19	92.16	7.84	98.04	1.96	5.88
9	Wearing mask in a public place can prevent the infection of COVID-19	82.35	17.65	95.10	4.90	12.75
10.	Mask can be were repeatedly and interchangeably	70.59	29.41	85.29	14.71	14.7

Abbreviations: T= True; F= False

Table 2 shows that 67.65% of respondents in this study had sufficient knowledge in controlling COVID-19, increasing to 85.62% after receiving education from apothecary students. The effect of education on increasing respondents' knowledge was evidenced by statistical tests using the Wilcoxon test with the result of p-value = 0.000 (p <0.005) **(Table 3)**.

Table 2. The Influence of education on respondent's knowledge of COVID-19

Category	Score (%)	Pre-test (%)	Post-test (%)	p-value
Good	76-100	67.65	85.29	
Moderate	55-75	25.49	12.75	0.000
Less	<55	6.86	1.96	

Statistic: Wilcoxon test (p<0.05)

The results in **Table 3** show changes in the distribution of answers from the respondents' perceptions. About 10.78% of respondents are not optimistic that they will seek treatment at health services (Doctor/ Primary health care/ Clinic/ Hospital) if they show symptoms of COVID-19 and avoid COVID-19 infection by implementing health protocols. The distribution of respondents' perceptions shows an increase in people's positive perceptions of COVID-19 after receiving education from apothecary students.

Table 3. Distribution of Respondent's Perception of COVID-19

No	Statement	Percentage (N=102)							
		Pre-test (%)				Post-test (%)			
		SA	A	DA	SDA	*SA*	A	DA	SDA
1	I feel that COVID-19 is a deadly disease	44.12	36.27	10.78	8.82	55.88	31.37	5.88	6.86
2	I feel that I am at risk to get infected by COVID-19	13.73	45.10	35.29	5.88	23.53	48.04	20.59	7.84
3	I am afraid to get infected with COVID-19 if I am in a public place or being in the crowds	28.43	47.06	16.67	7.84	42.16	43.14	6.86	7.84
4	If I am happened to have one of the symptoms of COVID-19, I will quickly go to the health center (Doctor/primary health care /Hospital)	42.16	39.22	8.82	9.80	47.06	38.24	4.90	10.78
5	If I am experiencing flu when I am outside the house I will wear a mask	50.98	27.45	11.76	9.80	51.96	32.35	5.88	9.80
6	I have to gain more information about COVID-19	41.18	40.20	11.76	6.86	52.94	31.37	8.82	6.86
7	I feel that the information related to COVID-19 gives enough knowledge about the disease	28.43	52.94	13.73	4.90	37.25	47.06	7.84	7.84
8	I rarely take any information related to COVID-19 directly without re-checking it first	28.43	48.04	14.71	8.82	42.16	39.22	11.76	6.86
9	I want to share the information I have about COVID-19 to anyone else	15.69	63.73	17.65	2.94	38.24	52.94	11.76	6.86
10.	If I am practicing the health protocols (washing hands, wearing make, social distancing), I will be protected from COVID-19	44.12	36.27	10.78	8.82	52.94	31.37	4.90	10.78

Abbreviations: SA=strongly agree; A=agree; DA=disagree; SDA=strongly disagree

Apothecary education in the community affects changes in positive responses p-value= 0.000 (p <0.05) **(Table 4)**. Most of the respondents had a positive perception of 78.43%, and it increased to 84.31%.

Table 4. The influence of education on respondent's perception related to COVID-19

Category	Score (%)	Pre-test (%)	Post-test (%)	p-value
Positive	80-100	78.43	84.31	0.000
Negative	<80	21.57	15.69	

Statistic: Wilcoxon test (p<0.05)

Apothecary students are prospective health workers who have important responsibilities and roles in health promotion in controlling the COVID-19 pandemic [12]. One of the efforts made is to prepare a health promotion program that aims to increase public knowledge and perceptions of pandemic control. The health promotion program is education through videos compiled by apothecary students to ward off various hoax information in the community [13].

The results showed that apothecary student education affected public knowledge and perceptions in controlling COVID-19. Pharmacy educational materials can help the public increase their knowledge of COVID-19 control, including recognizing the signs and symptoms of COVID-19 infection, guiding respondents about the actions taken, and managing the symptoms they experience by clarifying information related to COVID-19 [14]. Some points of knowledge and questions that still need further education are COVID-19 caused by viruses or bacteria, availability of COVID-19 immunization/vaccine, and the use of masks interchangeably with other people.

The community knows that COVID-19 is caused by bacteria **(Table 1)**, so the therapy given is in the form of antibiotics [15]. A study supports the use of broad-spectrum antibiotics with a duration of seven days for COVID-19 patients to control further infection and complications during hospitalization [16, 17]. COVID-19 is a viral infection that must be prevented by giving vaccines [18]. The availability of vaccines in Indonesia, which began to be injected gradually in January 2021, is still the pros and cons. People are worried about the side effects and symptoms of the Covid-19 vaccine [19]. Therefore, a more educational campaign is needed so that all health workers and the public are ready to be vaccinated [20]. Education about the use of masks is always provided so that people are aware of protecting themselves and others to work effectively when everyone is wearing them and not taking turns [21]. The public knows that COVID-19 can be controlled by applying health protocols and restrictions on mobility and maintaining distance [22], and does not require treatment through health services. People do not agree to go to primary health care/ hospital because they are worried about high infection rates, so they prefer to be safe by self-quarantine and isolation at home during the pandemic [23, 24]. Further education is needed to increase their knowledge, including their adherence to implementing health protocols campaigned. Also, people tend to be relaxed and do not care about individuals' and others' safety, supported by the government's absence of strict sanctions [25].

Respondents in Yogyakarta, Indonesia, have a positive perception of facing a pandemic. In a study in Wuhan, China, where people have an optimistic attitude toward COVID-19, 90.8% believe COVID19 will eventually be controlled, and 97.1% believe that China can win the battle against the virus [9]. A survey that shows negative perception during the post-test still can be found in a few respondents. Some study evaluation results of one's perception that tend to be negative toward controlling COVID-19 are often associated with the apathy or pessimistic perception toward the government in managing the pandemic, which is still insufficient. Thus, it needs more significant endeavor from the health authority and government [26]. By providing continuous education involving apothecary and all health workers, it is expected that a society that has a better level of understanding has an optimistic perception of controlling the COVID-19 pandemic.

Indonesian Health Ministry has made guidance in preventing and controlling COVID-19, including providing public awareness campaigns. The ministry has also worked with public, print, and electronic media, especially with a social media platform. However, misinformation has also increased. The Indonesian government has also implemented large-scale social restrictions, and restrictions on prayers at mosques, schools, and universities. However, this is sometimes in contrast to other findings showing that people tend to express their negative emotions like anxiety and panic and do not obey the pandemic's health protocols. It can affect their perception [3, 27]. Therefore, as has been done in this research, personal education becomes crucial to straightening rumors and hoaxes through social media.

All health workers' endeavors in promoting scientific health and education to the public will be a determination point in the effectiveness of controlling COVID-19 through knowledge approach, perception, behavior, and perspective of society [20]. Health promotion programs carried out by pharmacy students impact increasing public knowledge and good perceptions, extending the role of pharmacists in ways that are beneficial to the communities where they work [28, 29]. By providing continuous education involving apothecary and all health workers, it is expected that the community who has a better level of understanding has a positive and optimistic perception of controlling the COVID-19 pandemic [30, 31].

This research has a limitation in the number of samples involved in this research. The health protocols that the researchers must implement have become the cause that education is given through video and minimum contact with respondents. This might decrease the respondent's understanding in comprehending the information from both the video and apothecary student. This research is further suggested considering those disadvantages. However, the research team believes that the main result of this research will not change significantly.

Conclusion

The practice of apothecary students in providing education related to COVID-19 control has a significant impact on increasing public knowledge and perceptions in handling COVID-19 ($p=0,000$). Educational interventions can also reduce the proportion of respondents who have negative perceptions. Education related to COVID-19 control must be carried out to the broader community and continue to be carried out to increase people who have the proper knowledge and positive perceptions.

Acknowledgments: None

Conflict of interest: None

Financial support: We are grateful to The Pharmacist Professional Program (Apothecary Program) of the Universitas Islam Indonesia for funding this research.

Ethics statement: None

References

1. World Health Organization. Coronavirus [Internet]. 2020 [cited 2020 Dec 28]; Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019
2. Coronavirus Updates. Coronavirus Updates [Internet]. 2021 [cited 2020 Dec 5]; Available from: https://www.worldometers.info/coronavirus/country/indonesia/
3. Ministry of Health. Emerging Infection [Internet]. 2020 [cited 2020 Dec 2]; Available from: https://infeksiemerging.kemkes.go.id/
4. Bukhari N, Rasheed H, Nayyer B, Babar ZUD. Pharmacists at the frontline beating the COVID-19 pandemic. J Pharm Policy Pract. 2020;13(1):1-4.
5. Song Y, Zhang M, Yin L, Wang K, Zhou Y, Zhou M, et al. COVID-19 treatment: close to a cure? A rapid review of pharmacotherapies for the novel coronavirus (SARS-CoV-2). Int J Antimicrob Agents. 2020;56(2):106080.
6. Al-Jamei S, Awas A, Al-Sakkaf M. Perceptions, Experiences, and Expectations of Hospital Physicians Regarding Pharmacists' Professional Duties in Yemen. Pharmacophore. 2021;12(2):39-45.
7. Li H, Liu SM, Yu XH, Tang SL, Tang CK. Coronavirus disease 2019 (COVID-19): current status and future perspectives. Int J Antimicrob Agents. 2020;55(5):105951.
8. The International Pharmaceutical Federation. Information and interim guidelines for pharmacists and the pharmacy workforce [Internet]. FIP Health Advis. 2020 [cited 2020 Nov 2]; Available from: https://www.fip.org/files/%0Acontent/priority-areas/coronavirus/Coronavirus-guidance-update-ENGLISH.pdf,
9. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, et al. Knowledge, attitudes, and practices towards COVID-19 among chinese residents during the rapid rise period of the COVID-19 outbreak: A quick online cross-sectional survey. Int J Biol Sci. 2020;16(10):1745-52.
10. Shereen MA, Khan S, Kazmi A, Bashir N, Siddique R. COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. J Adv Res. 2020;24:91-8. doi:10.1016/j.jare.2020.03.005
11. Van Nguyen H, Tran HT, Khuong LQ, Van Nguyen T, Ho NTN, Dao ATM, et al. Healthcare workers' knowledge and attitudes regarding the world health Organization's "my 5 moments for hand hygiene": Evidence from a Vietnamese central general hospital. J Prev Med Public Health. 2020;53(4):236-44.
12. Kristina SA, Herliana N, Hanifah S. The perception of role and responsibilities during covid-19 pandemic: A survey from indonesian pharmacists. Int J Pharm Res. 2020;12(2):3034-9.
13. Chirwa GC. "Who knows more, and why?" Explaining socioeconomic-related inequality in knowledge about HIV in Malawi. J Sci Afr. 2020;7:e00213. doi:10.1016/j.sciaf.2019.e00213
14. Elbeddini A, Yeats A. Pharmacist intervention amid the coronavirus disease 2019 (COVID-19) pandemic: From direct patient care to telemedicine. J Pharm Policy Pract. 2020;13(1):1-4.
15. World Health Organization. Coronavirus disease (COVID-19) advice for the public: Mythbusters [Internet]. 2020 [cited 2020 Dec 21]; Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters
16. Beović B, Doušak M, Ferreira-Coimbra J, Nadrah K, Rubulotta F, Belliato M, et al. Antibiotic use in patients with COVID-19: a "snapshot" Infectious Diseases International Research Initiative (ID-IRI) survey. J Antimicrob Chemother. 2020;75(11):3386-90.
17. Seaton RA, Gibbons CL, Cooper L, Malcolm W, McKinney R, Dundas S, et al. Survey of antibiotic and antifungal prescribing in patients with suspected and confirmed COVID-19 in Scottish hospitals. J Infect. 2020;81(6):952-60.
18. Zhu Y, Li J, Pang Z. Recent insights for the emerging COVID-19: Drug discovery, therapeutic options and vaccine development. Asian J Pharm Sci. 2021;16(1):4-23. doi:10.1016/j.ajps.2020.06.001
19. Sayis AA, Filmban DM, Basmih AA, Alahmadi LS, Telmisani NA, Alaql AS, et al. Awareness of the Risk Perceptions Attitude about Signs and Symptoms of the Vaccination against COVID-19. Pharmacophore. 2022;12(4):131-40.
20. Papagiannis D, Malli F, Raptis DG, Papathanasiou IV, Fradelos EC, Daniil Z, et al. Assessment of knowledge, attitudes, and practices towards new coronavirus (SARS-CoV-2) of health care professionals in greece before the outbreak period. Int J Environ Res Public Health. 2020;17(14):1-14.
21. Centers for Disease Control and Prevention. Considerations for Wearing Masks [Internet]. 2020 [cited 2021 Jan 2]; Available from: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover-guidance.html
22. Durmus H, Gökler ME, Metintas S. The effectiveness of community-based social distancing for mitigating the spread of the COVID-19 pandemic in Turkey. J Prev Med Public Health. 2020;53(6):397-404.

23. Song W, Sawafta FJ, Ebrahem BM, Jebril MA. Public Attitude towards Quarantine during the COVID-19 Outbreak. J Epidemiol Infect. 2020;148(e220):1-6.
24. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. Asian J Psychiatr. 2020;51:102083.
25. Centers for Disease Control and, Prevention. How to Protect Yourself & Others [Internet]. 2020 [cited 2021 Jan 12]; Available from: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html
26. Anwar S, Araf Y, Newaz Khan A, Ullah MA, Hoque N, Sarkar B, et al. Women's Knowledge, Attitude, and Perceptions Toward COVID-19 in Lower-Middle-Income Countries: A Representative Cross-Sectional Study in Bangladesh. Front Public Health. 2020;8:721. Available from: https://www.frontiersin.org/article/10.3389/fpubh.2020.571689
27. Leung GM, Lam TH, Ho LM, Ho SY, Chan BHY, Wong IOL, et al. The impact of community psychological responses on outbreak control for severe acute respiratory syndrome in Hong Kong. J Epidemiol Community Health. 2003;57(11):857-63.
28. Al-Tukmagi H, Allela OQB, Fawzi HA, Fakhri DH. National Survey: Knowledge, Attitude and Practice Towards COVID-19 among Iraqi Pharmacy Students. Arch Pharm Pract. 2021;12(2):54-9.
29. Kristina SA, Yulianto Y, Prabandari YS. Early experience with a health promotion course for pharmacy students in Indonesia. Health Educ J. 2018;77(2):241-8.
30. Islahudin F, Ariffin NM, Aziz SAA. COVID-19 One Year on Community Response to the New Norms among Malaysians. Arch Pharm Pract. 2022;12(4):69-75.
31. Prakash D, Reddy K, Athul K, Swamy S, Bhodaji S, Deshmukh A, et al. Knowledge, Attitude, Awareness and Practice Towards Covid-19 Pandemic in Indian Citizens During the National Lockdown Period: a Quick Online Cross-Sectional Study. Int J Physiother Res. 2020;8(3):3504-1.