Level of Knowledge, Attitude and Practice of Patients with Metabolic Syndrome History on the Covid-19 Prevention Efforts at Klinik Budi Peni Surakarta

Oktivania Veda Tiyasa(✉), Venti Agustina, and Catherine Natawirarindry

Nursing Department, Faculty of Medicine and Health Sciences, Satya Wacana Christian University Salatiga, Salatiga, Indonesia
aldvedaa@gmail.com

ABSTRACT. COVID-19 tends to be severe and shows a poor prognosis, especially in patients with underlying comorbidities such as metabolic syndrome. With no definitive therapy for COVID-19, it is imperative that people with a history of metabolic syndrome need to take extra precautions and adhere to them strictly. However, people's compliance with these control measures will be greatly influenced by their knowledge, attitudes, and practices towards COVID-19. Therefore, the aim of this study was to examine knowledge, attitudes, and practices in patients with a history of metabolic syndrome to prevent Covid-19. This research uses a quantitative method with a descriptive research type—the Categorization of knowledge values, attitudes, and behavior using the Bloom cut-off point method. The research instrument was a questionnaire containing demographic data, knowledge, attitudes, and Covid-19 prevention practices. The results of this study indicate that the level of knowledge and attitudes is moderate, and practice in preventing COVID-19 is considered lacking. In this study, there were still many respondents who behaved inconsistently with their knowledge and attitudes and were still carried away by their old behavior in their daily lives. Knowledge and attitudes are the determining factors for a person to take positive or negative actions. Knowledge and attitudes that are still in the low and moderate categories are the triggers for the extent of the practices shown by respondents in preventing Covid-19. This study concludes that not all respondents are categorized as lacking in their behavior to prevent covid-19. The respondents who have good behavior must have good knowledge and attitude values as well.

Keywords: Knowledge · Attitude · Practice · Metabolic syndrome · Covid-19 · Covid-19 prevention

1 Introduction

Metabolic syndrome is a health problem which the cases number is still very high in Indonesia. Metabolic syndrome is one of the leading causes of morbidity and mortality worldwide. The metabolic syndrome term is a collection of symptoms of various risk

D. A. Kurniawan (Ed.): GDIC 2022, ASSEHR 772, pp. 149–161, 2023.
https://doi.org/10.2991/978-2-38476-110-4_16

factors for metabolic diseases, such as; hypertension, central obesity, insulin resistance, glucose intolerance, dyslipidemia, non-alcoholic fatty liver disease (NAFLD), which occur simultaneously, thus increasing the risk of heart disease, stroke, and diabetes [1].

The International Diabetes Federation (IDF) states that the diagnosis of metabolic syndrome has been adjusted for Asians, that if a person has at least three or more risk factors of metabolic syndrome such as central obesity with an abdominal circumference of 80 cm for women and for men 90 cm, blood triglyceride levels 150 mg/dL or 1.69 mmol/L, systolic blood pressure 130 mmHg, diastolic blood pressure 85 mmHg or currently taking antihypertensive drugs, fasting blood glucose levels 110 mg/dL or 6.10 mmol/L or currently taking anti-diabetic drugs.

The incidence of metabolic syndrome is related to the current lifestyle of humans who prefer to eat instant and westernized food. Consuming meat, milk, and fried foods can increase metabolic syndrome in a person. That people aged more than ten years are less in consuming vegetables and instead choose foods that are high in fat, cholesterol, sugar, and sodium. In addition, a sedentary lifestyle is also one of the factors that cause a person to be at risk of developing metabolic syndrome and other degenerative diseases.

The increasing prevalence of metabolic syndrome has an impact on increasing cardiovascular disease sufferers. A total of 21.7% of patients experienced cardiovascular disorders and death. Cardiovascular disease is currently settled in the first rank as a disease that causes death in Indonesia, with a percentage of 49.9%. Therefore, patients with metabolic syndrome urgently require to get special attention and care from the government, health workers, and the community. However, the impact of the spread of the Covid-19 pandemic is still very high, causing people with metabolic syndrome to be neglected.

At the end of 2019 to August 2021, the world was shocked with Covid-19 cases, which took more than 200 million confirmed cases and reached 4,377,979 people died [2]. The number of Covid-19 cases in Indonesia itself is increasing every day, with more than 3.9 million confirmed cases, 121,141 deaths, and 3.4 million of them recovered. Based on Covid-19 data in Surakarta, it shows that until August 2021, there were 25,096 confirmed cases with 567 people undergoing independent isolation,211 people in centralized isolation, 113 people receiving treatment, 23,390 people recovered, and 1026 of them were confirmed dead (Dashboard Data Covid -19 Surakarta City, 2021). The efforts to prevent Covid-19 in Indonesia continue to be promoted by the government in all sectors, including the economy, education, and the health sector. This is one of the efforts of the government and health workers to deal with the spread of Covid-19 in Indonesia.

The increase in Covid-19 poses a hazardous risk in people who have metabolic syndrome. Research conducted by [3] showed that most of the deaths of patients exposed to the coronavirus were experienced by people with metabolic syndrome. Metabolic syndrome has the potential to worsen the severity of COVID-19. In the absence of definitive therapy to fight Covid-19, it is imperative that people with a history of metabolic syndrome need to take extra precautions and strictly adhere to social distancing and hand hygiene recommendations and ensure regular health checks. On the other hand, people's compliance with Covid-19 control measures will be greatly influenced by their knowledge, attitudes, and practices towards COVID-19, according to the "Knowledge,

Attitude and Practice" theory [4]. The theory of "Knowledge, Attitude and Practice" is a theory of change in health practice where practice change in humans is divided into three successive processes, such as; acquisition of the right knowledge, taking the right attitude, and adopting behavior or practice [5]. Several studies have shown that the level of KAP in individuals is associated with effective disease prevention and management as well as health promotion itself. In addition, lack of knowledge, attitudes, and practices can be associated with poor health and non- adaptive disease prevention behaviors. It is thus hoped that the KAP levels of patients with a history of metabolic syndrome will be a determining factor against COVID-19.

Based on the background, this study aims to examine the level of knowledge, attitudes, and practices in patients with a history of metabolic syndrome in an effort to prevent Covid-19.

2 Method

This study is quantitative research by describing the knowledge, attitudes, and practices of patients with a history of metabolic syndrome in an effort to prevent COVID-19. This study was conducted at Budi Peni Clinic Surakarta in August- September 2021. This study involved 83 respondents with the inclusion criteria are male and female patients, aged 20–60 years, who had at least three or more risk factors for metabolic syndrome such as central obesity with a circumference of abdomen 80 cm for women and 90 cm for men, blood triglyceride levels 150 mg/dL or 1.69 mmol/L, systolic blood pressure 130 mmHg, diastolic blood pressure 85 mmHg, fasting blood glucose levels 110 mg/dL or 6.10 mmol/L. Exclusion criteria are not Budi Peni clinic patients, aged less than 20 years or more than 60 years, have no risk factors for metabolic syndrome or have risk factors for metabolic syndrome less than three points, not Javanese, and not willing to be respondents. After being identified, seven respondents eliminated of the 83 respondents who were not of Javanese ethnicity (Sunda, Batak, Dayak, and Chinese) were excluded from this study. So, the number of research subjects is 75 respondents.

The research instrument was a questionnaire that was adapted and translated from a questionnaire owned by Akalu Y., Ayelign, B., Molla, MD in accordance with the Journal of Knowledge, Attitude and Practice Towards Covid-19 among Chronic Disease Patients at Addis Zemen Hospital, Northwest Ethiopia 2020 [6]. The questionnaire contains 54 statements and questions covering demographic data, level of knowledge, attitudes, and practices related to Covid-19, which will be made in a hard file questionnaire and a google form link. This questionnaire has been tested on 30 respondents, and there were 38 valid questions obtained after measuring the validity and reliability test. The results of the reliability test in this study were > 0.6. The reliability value of the knowledge category is 0.741, attitude is 0.891, and practice is 0.687. There are 8 statement items in the knowledge statement table, a correct answer was assigned 1 point, and an incorrect/unknown answer was assigned 0 points. Similarly, in the practice section, there are nine questions and will be given a score of a correct answer (1 point) and an incorrect answer (0 points) based on the Guttman scale. The total score of respondents' knowledge ranges from 0–9 points which will be categorized using Bloom cut-off points. The scores obtained will be categorized as follows: good if the score is between 80–100%

(6.4–8 points), moderate if the score is between 60–79% (4.8–6.32 points), and poor if the score is less than 60% (<4.8). Similarly, the assessment of the total score of the respondent's practice section will be categorized as follows: good if the score is between 80–100% (7.2–9 points), moderate if the score is between 60–79% (5.4–7.11 points), and poor if the score is less than 60% (<5.4 points). In the attitude section, there will be 12 statements containing answers with a Likert scale, 1 item of statements is rated on a High (4), Medium (3), Low (2), and Very Low (1) scale; while the other 11 items will be scored on a scale of Very Easy (4), Easy (3), Difficult (2), and Very Difficult (1). Data analysis was performed using SPSS univariately.

This research has been granted an ethical feasibility test permit by the Satya Wacana Christian University Ethics Committee with the number 144/KOMISIETIK/EC/9/2021. The results of this study will be stored by the department to be used as material for further research or learning, and data obtained from respondents will be destroyed or deleted if it's judged to be irrelevant or no longer needed. The data from this study can only be accessed by the research team.

3 Results

3.1 Respondents Characteristic

A total of 90 respondents have completed a questionnaire regarding the knowledge, attitudes, and practices of patients with a history of metabolic syndrome in an effort to prevent COVID-19 at the Budi Peni Clinic, Surakarta. This study categorizes respondents based on gender, age, last education, occupation, marital status, medical diagnosis, disease history, and sources of health information obtained. The data describing the characteristics of the respondents based on the demographic distribution data can be seen in Table 1.

All respondents in this study were from Javanese. Based on gender, male patients were 52% higher than female patients 48%. The majority of respondents in this study were 45–54 years old (48%). A total of 37 (49.3%) respondents are high school graduates, more than other levels of education. There are 6 (8%) respondents who are uneducated or have not attended school. The majority of respondents (37.3%) are private employees. The other occupation data in this study are laborers, students, employees, traders, artists, employees of state-owned enterprises, state civil apparatus, farmers, and one of them is unemployed or does not have a job. The distribution of marital status stated that 65 (86.7%) of married respondents were higher than 8% of unmarried respondents and widowed (5.3%).

Based on the medical diagnosis, the majority of respondents had diabetic ulcers, and two of them had to have an amputation of the necrotic organs. After a diabetic ulcer, 15 (20%) patients came to the clinic to check the blood pressure and also the laboratory tests, and the results would be consulted with a doctor. A total of 28 (37.3%) patients had other medical diagnoses, including dyspepsia, pharyngitis, abscess, GERD, myalgia, flu and cough, vertigo, and vulnus laceratum.There are several respondents who have a history of diseases related to metabolic syndrome, 25 (33.3%) respondents have diabetes mellitus, and 23 (30.7%) respondents have hypertension. These two diseases have the highest numbers among all diseases. The rest of the respondents have one or

Table 1. Demographic and Clinical Characteristics of Patient in Klinik Budi Peni

Variables	Category	Frequency (n = 75)	%
Sex	Male	39	52
	Female	36	48
Age	15–24 years old	6	8
	25–34 years old	6	8
	35–44 years old	14	18,7
	45–54 years old	36	48
	55–64 years old	13	17,3
Educational Status	Elementary School	7	9,3
	Junior High School	11	14,7
	Senior High School	37	49,3
	College	14	18,7
	Uneducated	6	8
Occupation	Private Sector Employee	28	37,3
	Housewife	10	13,3
	Entrepreneur	8	10,7
	Others	29	38,7
Marital Status	Married	65	86,7
	Unmarried	6	8
	Widowed	4	5,3
Medical Diagnosis	Diabetic Ulcer	20	26,7
	Hypertension	12	16,0
	Blood Pressure & Laboratory check	15	20,0
	Others	28	37,3
Disease History	Diabetes Mellitus	25	33,3
	Hypertension	23	30,7
	Diabetes Mellitus dan hypertension	7	9,3
	Others	20	26,7
HealthInformation Source	Health workers	1	1,3
	Television/Radio	5	6,7
	Social Media (WhatsApp, Instagram, Facebook, etc.)	23	30,7

(*continued*)

Table 1. (*continued*)

Variables	Category	Frequency (n = 75)	%
	Health workers and TV/Radio	13	17,3
	Health workers and social media	12	16,0
	TV/Radio dan social media	16	21,3
	Health workers, TV/Radio, and social media	5	6,7

more history of diseases such as cholesterol, high triglycerides, gout, and back pain. In addition, almost 30.7% of respondents received health information about Covid-19 from social media such as WhatsApp, Instagram, Facebook, and others. Only 1 (1.3%) respondent received health information from health workers (Table 2).

Based on Table 1.2, respondents who categorized into obesity criteria 2 reach 44% more than all respondents in this study. People with central obesity and have high blood sugar levels tend to eat foods that are high in carbohydrates and glucose, as same as Susantis research states that people with diabetes mellitus tend to eat foods that contain lots of sugar and have high glucose levels so that it will trigger high sugar levels even obesity [7]. The eating habits of Javanese people who tend to be processed with sweet foods can also be one of the triggers for increasing blood sugar.

On the other hand, the age above 45 years is one of the ages that are susceptible to having metabolic syndrome. This is confirmed in Achmad's research in the journal [8], which states that the prevalence of metabolic syndrome will increase with age. Zahtamal's research also suggests that men experience metabolic syndrome more than women.

3.2 Level of Knowledge

A total of 33% of respondents also had a systolic value which was categorized as level 2 hypertension. The results of the respondents' diastolic blood pressure in this study were included in the pre-hypertension category, with 24 respondents more than level 1 and 2 hypertension. Not all respondents were tested for blood triglycerides. But from the existing data of 50 respondents, 35 people had triglyceride levels of 200 mg/dl. From all the respondents in this study, more than half of the respondents had blood sugar that was included in the category of diabetes mellitus. Not all patients fill their pre-prandial blood sugar. A total of 7 patients filled their postprandial blood sugar because, at that time, there were several patients who were examined had abscesses, and after the examination, the doctor suggested to check their blood sugar. After laboratory examination, it was found that some respondents had high blood sugar. Thus, their wounds do not heal (Table 3 and 4).

The first thing assessed in this study is the level of patient knowledge regarding Covid- 19 prevention efforts. After calculating using the Bloom cut-off point, the results

Table 2. Respondents Characteristic Based on BMI and Metabolic Examination

Variables	Category	Frequency (n = 75)	%
BMI	Obesity 2	33	44
	Obesity	21	28
	Overweight	10	13,3
	Normal	11	14,7
Abdomen circumference	Male		
	≤ 90	1	1,3
	≥ 90	38	50,7
	Female		
	≤ 80	0	0
	≥ 80	36	48
Blood Pressure	Systole		
	HT - level 2(>160)	25	33,3
	HT - level 1(140–150)	20	26,7
	Pre - HT (120–139)	23	30,7
	Normal (<120)	7	9,3
	Diastole		
	HT - level 2(>100)	23	30,7
	HT - level 1(90–99)	23	30,7
	Pre - HT (80–89)	24	32,0
	Normal	5	6,7
Triglyceride	≤ 200 mg/dl	35	46,7
	≥ 200 mg/dl	15	20
	Not tested	25	33,3
Blood Sugar	DM (GDS ≥ 200/GDP ≥ 126)	51	68,0
	UncertainDM(GDS100- 199/GDP 100–125)	15	20,0
	Notdiabetes(GDS < 100/GDP < 100)	9	12,0

showed that the majority of patients, as many as 36 (48%) respondents had moderate knowledge, 21 (28%) respondents had a good level of knowledge, the remaining 18 (24%) respondents have poor knowledge about prevention of COVID-19. It's indicated in statement 4, "Touching an object or surface with the virus on it, then touching your mouth, nose, or eyes with unwashed hands will result in infection with the COVID-19 virus". At this point in the statement, 12 respondents answered incorrectly, and the other 28 respondents did not know. The same thing was also found in statement 6 "Persons with COVID-19 cannot transmit the virus to others if he or she does not have COVID-19

Table 3. Frequency of Responses by the Study Respondents for Knowledge Question

No	Knowledge Questions	Frequency		
		Correct (n, %)	Incorrect (n, %)	I Don't Know (n, %)
1	Unlike the common cold, runny nose, and sneezing are less common in persons infected COVID-19 virus	44 (58,7)	12 (16)	19 (25,3)
2	Currently, there are no effective treatment for COVID-19, but early symptomatic and supportive treatment can help most patients to recover from the infection	41 (54,7)	14 (18,7)	20 (26,7)
3	Not everyone with COVID-19 will make a severe case. Those who are elderly, have chronic diseases, and with low immunity are more likely to have severe cases.	70 (93,3)	1 (1,3)	4 (5,3)
4	Touching an object or surface with the virus on it, then touching your mouth, nose, or eyes	35 (46,7)	12 (16)	28 (37,3)

Table 4. Distribution of Frequency and Percentage Level of Knowledge about Covid-19

Category	Frequency (n = 75)	%
Good	21	28
Moderate	36	48
Poor	18	24

symptoms". At statement point number 6, 41 respondents did not know the answer they would choose (Table 5 and 6).

3.3 Respondent's Attitudes

Most respondents in this study revealed that their attitude in protecting themselves from disease was in the medium and high categories. Respondents who answered medium were more than those who answered high with a percentage of 54.7 percent compared to 42.7 percent. Furthermore, the statement points that are the most difficult for respondents

Table 5. Attitude of Patients in Klinik Budi Peni with Metabolic Syndrome Towards COVID-19

No	Questions	High	Moderate	Low	Very Low
1	How much do you protect yourself from illness/self-care?	32 (42,7)	41 (54,7)	2 (2,7)	0 (0)
		Very Easy	Easy	Difficult	Very Difficult
2	Washing hands frequently for 20 s with soap or using hand sanitizer	16 (21,3)	54 (72)	5 (6,7)	0 (0)
3	Avoiding touching face with unwashed hands.	5 (6,7)	34 (45,3)	32 (42,7)	4 (5,3)
4	Avoiding shaking hands with other people	15 (20)	47 (62,7)	12 (16)	1 (1,3)
5	Avoiding the crowd	6 (8)	58 (77,3)	11 (14,7)	0 (0)
6	Practicing physical distancing	6 (8)	56 (74,7)	13 (17,3)	0 (0)
7	Covering mouth or nose when coughing or sneezing with elbow/tissue	10 (13,3)	49 (65,3)	16 (21,3)	0 (0)
8	Avoiding close contact with sick people	20 (26,7)	52 (69,3)	3 (4)	0 (0)
9	Using a mask when leaving the house	47 (62,7)	27 (36,0)	1 (1,3)	0 (0)
10	Listening and following government advice	16 (21,3)	58 (77,3)	1 (1,3)	0 (0)
11	Immediately isolate yourself to avoid spreading, if you get sick	11 (14,7)	54 (72,0)	10 (13,3)	0 (0)
12	Staying home to minimize the risk of infection	6 (8)	46 (61,3)	20 (26,7)	3 (4)

Table 6. Distribution of Frequency and Percentage of Attitudes related to Covid-19

Category	Frequency (n = 75)	%
Good	21	28
Moderate	54	72
Poor	0	0

to respond to are statement 3, "Avoiding touching face with unwashed hands." The results of the attitude assessment show that there are no respondents who are considered poor in attitude to prevent COVID-19. A total of 54 (72%) respondents were in the moderate category to prevent covid-19, while only 21 (28%) of the remaining respondents had a good attitude in preventing covid-19 (Tables 7, 8 and 9).

3.4 Respondent's Practices

Otherwise, the practice of patients in this study was still poor in preventing COVID-19. Especially in terms of object cleanliness, only 14 respondents always clean or disinfect frequently touched objects or surfaces. In addition, as many as 51 respondents also still touched the front of the mask when they were about to take it off, as written in statement number 2. The results of the study on patient practice showed that 37 (49.3%) respondents were on the poor category to prevent covid- 19, 27 (36%) of the respondents were rated moderate, and only 11 (14.7%) respondents had good practices in their efforts to prevent covid-19.

From the results of multiple linear regression analysis, it is obtained the results of an F count of 23,505 with a probability of 0.000. This shows that the variables of attitude and knowledge have an effect on practice.

Table 7. Frequency of Responses by Metabolic Syndrome Patients for Practice Questions

No	Questions	Yes (n, %)	No (n, %)
1	Do you attend meetings, religious activities, social events, or any crowded places in the COVID-19 pandemic area?	11	64
2	If yes, do you touch the front of the mask when you take it off?	51	24
3	Do you wash your hands with soap and water frequently for at least 20 s or use 70% alcohol/sanitizer?	65	10
4	Do you touch your eyes, nose, and mouth frequently with unwashed hands?	40	35
5	Do you clean and disinfect frequently touched objects and surfaces?	14	61
6	Do you practice "physical distancing" by staying six feet/2 m from other people at all times?	55	20
7	Do you use the telephone, desk, office, or work tools and equipment from other workers?	20	55
8	Do you eat or drink at a restaurant?	45	30
9	Would you rather stay at home, in a room with an opened window during the Covid-19 pandemic?	63	12

Table 8. Distribution of Frequency and Percentage of Practices related to Covid-19 Prevention

Category	Frequency (n = 75)	%
Good	11	14,7
Moderate	27	36
Poor	37	49,3

Table 9. Relationship between Level of Knowledge, Attitude, and Practice of Patients with Metabolic Syndrome History in COVID-19 Prevention Efforts

			ANOVAb			
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regressio n	91.642	2	45.821	23.505	.000a
	Residual	140.358	72	1.949		
	Total	232.000	74			

4 Discussion

Knowledge is information known or realized by someone as the basis for how that individual will behave and act. Sources of information obtained by respondents contributed to the extent of respondents' knowledge of Covid-19 prevention efforts. In table 4, most of the respondents' knowledge is in a good category (48%), but when we viewed from the questions, there is only one statement that answered that they do not know about the transmission of Covid-19, and the other items are well known by the respondents. It shows that respondents' awareness about people with comorbid diseases or chronic diseases will be more severe if they got covid is very good because almost all respondents know it. As in previous studies, patients with a history of chronic illness infected with COVID-19 will affect their health conditions and can lead to death [9].

The level of knowledge, which is generally in the moderate category, can be caused by the differences in the sources of information obtained by the respondents. Because most respondents get information about covid-19 from social media, one of them is WhatsApp compared to information from health workers (Table 1). It may lead to differences in perceptions between people because the information through social media must also be confirmed. In addition, most respondents' educational background is high school, which allows the magnitude of information bias among the respondents.

The attitude assessment is still classified as moderate because some respondents said preventing covid is different from their previous habits. Touching the face with hands is a habit so that if something happens in the face area, for example, itching, stinging, wiping the mouth after eating, scratching the nose, or other things related to the face, it is a reflex action to touch it. This assumption is similar to Citroner's statement in the journal Theopilus which states that humans have the probability or possibility to touch their faces up to 16 times an hour [10]. Even though touching the face with unwashed hands is one of the entrances for viruses and bacteria to exist in our bodies, similar to the research conducted by Hastuti & Djanah, (2020), which said that touching the face, especially the nose or mouth with contaminated hands will be the entry portal for the virus to enter the human body [11].

Knowledge and attitude are the determining factors for a person to take action either positively or negatively. As stated in the book by Notoatmodjo, a person's attitude is a determinant of behavior change shown by a person in dealing with something. Acceptance or rejection is one form of attitude change itself [12]. If someone gets a good understanding, then the attitude shown will be directly proportional to his knowledge.

Likewise, practice or action will support knowledge and attitudes. This study shows that the respondent's practice or behavior is in the poor category (Table 8), where there are still many respondents who misbehave with their knowledge and attitudes. They are still carrying their old habits that have become their daily lives, such as still touching the front of the mask when they want to take it off, using office equipment with colleagues, and eating at a restaurant (Table 7). So, it can be concluded that knowledge and attitudes in the poor category are the triggers for the extent of the actions or behaviors shown by respondents to prevent covid-19.

5 Conclusion

Based on the results of this study, the knowledge and attitudes of respondents were in the moderate category, while the majority of respondents' practices were lacking. Whereas logically, if the respondent has a good level of knowledge and attitude, then the practice will be good too. The researcher assumes that not all respondents are categorized as poor in practice. The respondents who have good practice must have good knowledge and attitude values as well. Inappropriate practices in preventing COVID-19 are caused by the respondent's habits that take a long time to change, or it can also occur due to work demands or daily activities that are difficult to carry out if health protocols are required. Some assumptions from this researcher need to get further research in order to get valid and significant results.

References

1. Sumarni; Sari, P. (2018). Healthy Tadulako Journal (Sumarni, Puspita Sari : 15–21) 14. 4(1 156.
2. World Health Organization. (2020). Situation Report of Coronavirus Disease (Covid-19). Diakses dari https://doi.org/www.who.int/docs/default-source/coronaviruse/situation-reports/20200130-sitrep-10-ncov.pdf
3. Mai, F., del Pinto, R., & Ferri, C. (2020). COVID-19 and cardiovascular diseases. Journal of Cardiology, 76(5), 453–458. https://doi.org/10.1016/j.jjcc.2020.07.013
4. Ngwewondo, A., Nkengazong, L., Ambe, L. A., Ebogo, J. T., Mba, F. M., Goni, H. O., Nyunaï, N., Ngonde, M. C., & Oyono, J. L. E. (2020). Knowledge, attitudes, practices of/towards COVID 19 preventive measures and symptoms: A cross-sectional study during the exponential rise of the outbreak in Cameroon. PLoS Neglected Tropical Diseases, 14(9), 1–15. https://doi.org/10.1371/journal.pntd.0008700
5. Pal, R., Yadav, U., Grover, S., Saboo, B., & Verma, A. (2020). Knowledge, attitudes and practices towards COVID-19 among young adults with Type 1 Diabetes Mellitus amid the nationwide lockdown in India: A cross-sectional survey. January
6. Akalu, Y., Ayelign, B., & Molla, M. D. (2020). Knowledge, attitude and practice towards covid-19 among chronic disease patients at addis zemen hospital, Northwest Ethiopia. Infection and Drug Resistance, 13, 1949–1960. https://doi.org/10.2147/IDR.S258736
7. Fillat, M. T. (2018). Hubungan Pola Makan Dengan Kadar Gula Darah Ibu Hamil.
8. Zahtamal, K. , Ilmu, B., & Masyarakat- Kedokteran, K. (2017). The Prevalence of Metabolic Syndrome among Company Worke. Jurnal Kesehatan Masyarakat Nasional, 9(2), 113–120
9. Purwanti, O. S., Studi, P., Keperawatan, I., Kesehatan, F. I., & Surakarta, U. M. (2020). Strategi Peningkatan Kualitas Kesehatan Pasien Kronis di Era New Normal. 147–151.

10. Theopilus, Y., Yogasara, T., Theresia, C., & Octavia, J. R. (2020). Analisis Risiko Produk Alat Pelindung Diri (APD) Pencegah Penularan COVID-19 untuk Pekerja Informal di Indonesia. Jurnal Rekayasa Sistem Industri, 9(2), 115–134.
11. Hastuti, N., & Djanah, S. N. (2020). Literature Review Study: Transmission and Prevention of the Spread of Covid-19. Jurnal Kesehatan Masyarakat, 7(2), 70–79. https://ojs.uniska-bjm.ac.id/index.php/ANN/article/view/2984
12. Notoatmodjo, S. (2012). Promosi Kesehatan dan Ilmu Perilaku. Jakarta: Rineka Cipta