

Health Seeking Behavior of Patients with Ischemic Heart Disease during the COVID-19 Pandemic in the Outpatient Clinics of a Tertiary Hospital

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Abstract

Background. Ischemic Heart Disease is a chronic, progressive, and dynamic disease. It remains to be the number one cause of mortality globally and in the Philippines. Patients with IHD belong to the vulnerable group both before and during the COVID 19 pandemic. Currently, there have been changes in the healthcare system leading to decreased delivery of services such as outpatient care and development of medical care avoidance affecting patients' clinical outcomes.

Objectives. This study aimed to determine if there are any changes in the health seeking behavior of these patients during the pandemic in a single tertiary hospital.

Methods. Descriptive and analytical cross-sectional design was used. Majority of the population were 60 years old and above, female, unemployed, non-smokers, diagnosed with IHD for 5 years, with hypertension and type 2 diabetes mellitus as co-morbidities.

Results. It was shown that majority did not have any change in the frequency of consultation with their cardiologists and majority preferred face-to-face consultation. For those who had decreased frequency of consultation, their reasons include fear of contracting COVID-19, lockdown and travel restrictions, limited number of patients catered at the clinic and lack of finances. Majority remained to be compliant with their maintenance medications and claimed to be willing to seek consult if they will experience severe symptom such as chest pain. For those who were not willing to go to the hospital despite having severe symptoms, the following were their reasons: fear of going out due to COVID 19, symptoms were tolerable and were not considered emergency and hospitals were in full capacity. Majority were not admitted in the hospital but those who were not admitted had less frequent consultation with their cardiologists. Despite the COVID threat, majority still agreed that constant follow-up with their cardiologist is of paramount importance.

Conclusion.

Keywords: Ischemic Heart Disease, Health Seeking Behavior, COVID-19 pandemic

Introduction

Coronavirus disease 2019 (COVID-19) caused by the novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) had been declared a pandemic by the World Health Organization last March 11, 2020 producing an enormous number of human casualties, economic burden and disruption of the

healthcare delivery system.^{1,2} While COVID-19 primarily affects the lungs, it can also affect other organ systems particularly the cardiovascular system. Risk of severe infection and increased mortality has been documented in patients with co-morbidities such as hypertension, ischemic heart disease (IHD) and cardiomyopathy since it has been found that this viral illness can further damage myocardial cells through several pathophysiologic mechanisms including direct damage by the virus, systemic inflammatory responses, destabilized coronary plaque, and heightened hypoxia.^{3,4}

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IHD remains as the number one cause of mortality globally and in the Philippines affecting millions of people.^{5,6} IHD is a condition wherein there is inadequate cardiac blood flow, occurring when there is an imbalance between the myocardial oxygen supply and demand. The underlying pathological process is most frequently coronary artery disease due to atherosclerotic obstruction or spasm of the epicardial coronary arteries or microvascular dysfunction. Powerful risk factors of the disease include genetic factors, smoking, obesity, diabetes, and sedentary lifestyle. The common presentation is angina pectoris but it can also present atypically in the form of dyspnea, easy fatigability, nausea and fatigue especially among the elderly and diabetics. It is a chronic, progressive, and dynamic disease as it can at any time, translate to an unstable condition.⁷ Therefore, given the inherent vulnerability of these patients to develop worse outcomes such as myocardial infarction, secondary prevention composed of aggressive risk factor management, strict compliance to medical therapy and regular follow-up should be given utmost importance.⁸

With the steady rise in death tolls due to COVID-19, limitations on daily life including social isolation, movement restrictions and community lockdown are continuously being implemented. These had led to compromised access to healthcare especially among patients with chronic disease.⁹ In addition, reports are also emerging that patients with urgent non-COVID-19 health concerns are not getting adequate treatment due to resource constraints and concerns regarding the risk of coronavirus exposure.¹⁰ Case reports in Italy regarding medical care avoidance among patients who developed

acute coronary syndromes because of concerns about fear of contracting the virus during hospital stay have also been documented. Due to the delay in seeking healthcare, these patients ultimately developed dreadful clinical outcomes.¹¹

Although utmost effort should be made to limit the spread of COVID-19, attention should also be made to avoiding compromise of acute cardiovascular care. Prompt health-seeking is still critical for appropriate management. Healthcare seeking behavior has been defined as any action or inaction undertaken by individuals who perceive themselves to have a health problem for the purpose of finding an appropriate remedy.¹² Given that patients with pre-existing cardiovascular disease particularly those with IHD belong to the vulnerable group especially during this pandemic, determining their health seeking behavior is deemed important.

Currently, there are no available studies on the health seeking behavior of these patients both globally and locally. Looking into this will contribute to the awareness of a possibly overlooked aspect on the care of these patients especially during this time of pandemic with the goal of providing holistic care and better overall clinical outcomes.

The objectives of the study were first, to determine the clinic-epidemiologic profile of patients with IHD with regard to age, sex, employment status, presence of cardiovascular risk factors or co-morbidities such as hypertension, hypercholesterolemia, diabetes mellitus, obesity and smoking; time the patient was first diagnosed with IHD, available diagnostic tests on the day of consult such as 12 lead ECG, total cholesterol, low density lipoprotein, HbA1c, 2D echocardiography, treadmill stress test and the current medications being taken by the patient such as anti-platelet, angiotensin receptor II blocker, angiotensin converting enzyme inhibitor, beta blocker, calcium channel blocker, nitrate, diuretic and statin. The other objective was to assess the health seeking behavior of patients with IHD during the COVID-19 pandemic with regard to the frequency of consultation with their cardiologist before and during the pandemic, last consultation with the cardiologist, factors that affected the change in the frequency of consultation, preferred method of consultation, self-reported compliance with medical treatment, most common symptom experienced, hospital consultation if with severe symptom, admission and awareness of the need of regular follow-up with their cardiologist during the pandemic.

Methods

This study utilized a descriptive and analytical cross-sectional design. The study population included patients who were 30 years old and above, diagnosed with IHD before the COVID-19 pandemic, IHD patients who were having their outpatient follow-up consultation with their cardiologists at Notre Dame de Chartres Hospital (NDCH), Baguio City and those who were able to comprehend the questionnaire made by the researchers.

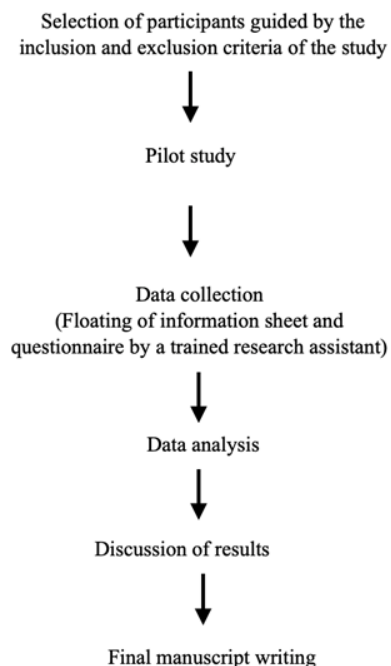


Figure 1. Flow Chart of the Study

Table I. Clinico-epidemiological profile of patients with ischemic heart disease during the COVID 19 Pandemic

VARIABLE		No. of Patients (%)
Age (years)	30 - 39	34 (14.5)
	40 - 49	43 (18.4)
	50 - 59	65 (27.8)
	60 and above	90 (38.5)
Gender	Male	66 (28.2)
	Female	168 (71.8)
Working status	Unemployed	146 (62.4)
	Employed	88 (37.6)
Smoking history	Non smoker	178 (76.1)
	Previous smoker	53 (22.6)
	Current smoker	3 (1.3)
Cardiovascular Risk factors	Hypertension	218 (93.2)
	Hypercholesterolemia	31 (13.2)
	Type 2 Diabetes Mellitus	45 (19.2)
	Obesity	32 (13.7)
Time first diagnosed with IHD	Less than a year ago	30 (12.8)
	1 year ago	16 (6.8)
	2 years ago	13 (5.6)
	3 years ago	29 (12.4)
	4 years ago	19 (8.1)
	5 years ago	30 (12.8)
Available Diagnostic tests on day of consult	More than 5 years ago	97 (41.5)
	12-Lead ECG	231 (98.7)
	Total Cholesterol	196 (83.8)
	LDL	195 (83.3)
	HgbA1c	94 (40.2)
	2D Echo	203 (86.8)
	Treadmill Stress Test	48 (20.5)
Other Diagnostic Tests	4 (1.7)	
Current Medications	Anti-platelet	228 (97.4)
	Angiotensin II Receptor Blocker	193 (82.5)
	Angiotensin-Converting Enzyme Inhibitor	3 (1.3)
	Beta Blocker	146 (62.4)
	Calcium Channel Blocker	93 (39.7)
	Nitrate	30 (12.8)
	Diuretic	18 (7.7)
	Statin	173 (73.9)
	Trimetazidine	57 (24.4)
	Metformin	4 (1.7)
	Amiodarone	3 (1.3)
	Methimazole	1 (0.4)
	Ketoanalogues	4 (1.7)

Newly diagnosed IHD patients, those who had COVID-19 infection and those who were not able to comprehend the questionnaire were excluded from the study (Figure 1).

Since there was no existing concrete census of patients having their outpatient consultation with their cardiologists at NDCH, the 2021 Baguio population which is 378,849 was used. In 2020, deaths due to IHD were the leading cause of death with 99,700 cases or 17.3% of the total deaths in the country. With the population size of 378,849 and the prevalence rate of 17.3%, using the Open-Epi online sample size calculator,

with 95% confidence level, the initially computed sample size was 220. Anticipating a 5% non-response or non-participation, the researchers considered a sample size of 232.

The research protocol was submitted to and approved by the Baguio General Hospital Medical Center Research Ethics Committee who works in collaboration with NDCH whose research ethics committee is still on the process of acquiring accreditation during the conduct of this study. The information sheet and questionnaire were formulated by the researchers. The questionnaires which were written in three languages namely Ilokano, Filipino and English was validated by a psychometrician and a cardiologist.

A pilot study was done at NDCH. The questionnaires were later provided to the private clinics of cardiologists at NDCH by a trained research assistant. The patients were given the chance to choose the type of questionnaire they will answer whether it be in Ilokano, Filipino and English. Number codes were utilized and no names were used which maintained the confidentiality and anonymity of the patients. Encoded data were saved in a password-protected file.

Descriptive statistics such as frequency and percentage were used. In addition, cross tabulations with Chi-square test were also employed to determine the possible associations of some variables. All computations were done using the statistical software SPSS version 21.0. All statistical tests were conducted at 0.05 level of significance.

Results

Majority of the study population were 60 years old and above (38.5%), female (71.8%) and unemployed (62.4%). Most were non-smokers (76.1%) while only 1.3% of the population are currently smoking. Hypertension and Type 2 Diabetes Mellitus were the two most common comorbidities (93.2% and 19.2% respectively) while only 13.7% were considered obese based on the World Health Organization BMI Classification. Majority of the patients were diagnosed with IHD for more than 5 years already (41.5%) while 12.3% of the study population were just diagnosed less than a year ago. 12 lead ECG and 2D echocardiography were the most common available diagnostic tests (98.7% and 86.8% respectively). The most common medications were anti-platelet (97.4%), angiotensin II receptor blocker (82.5%), statin (73.9%) and beta blockers (62.4%) while 24.4% were on trimetazidine (Table I).

Pre-pandemic, majority of the study population had their consultation with their cardiologist every 3 months (56.4%). Interestingly, during the COVID 19 pandemic, majority of the study population still had their consultation with their cardiologists every 3 months (47%). Moreover, most of the study population still preferred face-to-face consultation (96.6%) over virtual or tele-consultation (Table IIa). Majority of the study population did not have change in the frequency of consultation (57.3%). For the 9.8% of the study

Table IIa. Health seeking behavior of patients with ischemic heart disease during the COVID 19 Pandemic

VARIABLE		No. of Patients (%)
Frequency of consultation with the cardiologist pre-pandemic	Every week	0 (0)
	Every 2 weeks	1 (0.4)
	Once a month	18 (7.7)
	Every 2 months	11 (4.7)
	Every 3 months	132 (56.4)
	>3 months	69 (29.5)
Last Consultation with the cardiologist	As needed	3 (1.3)
	1 month ago	57 (24.4)
	2 months ago	25 (10.7)
	3 months ago	73 (31.2)
	4 months ago	14 (6.0)
	5 months ago	9 (3.8)
	6 months ago	33 (14.1)
> 6 months ago	23 (9.8)	
Frequency of Consultation with Cardiologist during Pandemic	Every week	1 (0.4)
	Every 2 weeks	2 (0.9)
	Every month	13 (5.6)
	Every 2 months	14 (6.0)
	Every 3 months	110 (47.0)
	> 3 months	89 (38.0)
	As needed	5 (2.1)
Preferred mode of consultation	Face to face	226 (96.6)
	Virtual or tele consult	5 (2.1)

Table 2b. Health seeking behavior of patients with ischemic heart disease during the COVID 19 Pandemic

VARIABLE		No. of Patients (%)
Change in the frequency of consultation	None	134 (57.3)
	Increased Frequency	23 (9.8)
	Decreased frequency	77 (32.9)
Reasons for the change in the frequency of consultation with their cardiologist	Fear of contracting COVID 19	41 (17.5)
	Lockdown/Travel restrictions	29 (12.3)
	Limited number of patients catered at the clinic	3 (1.3)
	Lack of budget	3 (1.3)
	Increased symptoms	14 (6.0)
	Adjustment of medications	6 (2.7)
	Stress/Anxiety	2 (0.9)
	Surgical Operation (Breast Surgery)	2 (0.9)

population who had increased frequency of consultation, the 2 most common reasons are increased in symptoms (6%) and adjustment of medications (2.7%). On the other hand, for those patients who had decreased frequency of consultation (32.9%), their reasons include fear of contracting COVID 19 (17.5%), lockdown and travel restrictions (12.3%), limited number of patients catered at the clinic (1.3%) and lack of finances (1.3%) (Table IIb). Majority of the study population were still compliant with

Table III. Compliance to Maintenance Medication of patients with of ischemic heart disease during the COVID-19 Pandemic

VARIABLE		No. of Patients (%)
Being Compliant with Medication	Yes	232 (99.1)
	No	2 (0.9)
Reasons Why Not Compliant	Lack of finances	2 (0.9)

Table IV. Most common symptom of patients with of ischemic heart disease during the COVID 19 Pandemic

VARIABLE		No. of Patients (%)
Most Common Symptom	Chest pain or Heaviness	107 (45.7)
	Palpitations	76 (32.5)
	Easy Fatiguability	63 (26.9)
	Difficulty of Breathing	35 (15.0)
	Anxiety	6 (2.6)
	Colds	2 (0.9)
	Cough	1 (0.4)
	Body Pains	1 (0.4)
	Headache	2 (0.8)
Willingness to go to the hospital if with severe symptom such as chest pain	Yes	211 (90.2)
	No	23 (9.8)
Reasons of NOT going to Hospital	Fear of going out due to COVID 19	14 (6.0)
	Symptoms are tolerable/not considered as emergency	6 (2.6)
	Hospitals are in full capacity	2 (0.9)

Table V. Admission in a hospital of patients with ischemic heart disease during the COVID 19 Pandemic

VARIABLE		No. of Patients (%)
Admitted in a hospital during the pandemic	Yes	59 (25.2)
	No	175 (74.8)
Still need constant follow up during pandemic	Yes	225 (96.2)
	No	1 (0.4)
	Not sure	2 (0.9)
	Maybe	5 (2.1)

their maintenance medications (99.1%). Only 0.9% was not compliant due to lack of finances (Table III).

The three most common symptoms experienced by the study population were chest pain or heaviness (45.7%), palpitations (32.5%) and easy fatigability (26.9%). Majority were willing to go to the hospital if they will experience severe symptom such as chest pain (90.2%). For those who were not willing to go to the hospital despite having severe symptoms (9.8%), the following were their reasons: fear of going out due to COVID 19 (6%), symptoms were tolerable and were not considered

Table VI. Significant Association of Frequency of Consultation with Cardiologist during the COVID 19 Pandemic and other characteristics

CHARACTERISTIC	Chi-square	p-value
Age	18.063	0.452
Sex	4.184	0.652
Working Status	11.594	0.072
Smoking History	14.099	0.294
Hypertension	12.413	0.053
Hypercholesterolemia	21.041	0.002
Type 2 Diabetes Mellitus	6.487	0.371
Obesity	11.652	0.070
Preferred mode of consult	4.007	0.676
Being Compliant with Medication	3.287	0.772
Willingness to go to hospital when symptoms get severe	6.041	0.419
Admitted in a hospital during the pandemic	20.873	0.002

Table VII. Significant Association of Being Compliant with Medications and other characteristics

CHARACTERISTIC	Chi-square	p-value
Age	5.183	0.159
Sex	0.792	0.373
Working Status	3.347	0.067
Smoking History	6.889	0.032
Hypertension	0.148	0.700
Hypercholesterolemia	0.308	0.579
Type 2 Diabetes Mellitus	8.472	0.004
Obesity	0.320	0.572
Preferred mode of consult	0.045	0.833
Willingness to go to hospital when symptoms get severe	0.220	0.639
Admitted in a hospital during the pandemic	0.680	0.410

Table VIII. Significant Association of Willingness to go to the hospital when symptoms get severe and other characteristics

CHARACTERISTIC	Chi-square	p-value
Age	4.001	0.261
Sex	0.545	0.460
Working Status	0.025	0.874
Smoking History	5.385	0.068
Hypertension	1.542	0.214
Hypercholesterolemia	1.758	0.185
Type 2 Diabetes Mellitus	1.823	0.177
Obesity	0.009	0.926
Preferred mode of consult	0.565	0.452
Willingness to go to hospital when symptoms get severe	0.220	0.639
Admitted in a hospital during the pandemic	0.163	0.686

emergency (2.6%) and hospitals were in full capacity (0.9%) (Table IV).

Only 25.4% of the study population were admitted. Reasons for admission were not included in the study. Majority of the study population (96.2%) agreed that

constant follow-up with their cardiologist during the COVID 19 pandemic is needed (Table V).

Of note, there was no significant association in the frequency of consultation and compliance to medications during the pandemic with the following characteristics: age, sex, employment status, smoking history, hypertension, hypercholesterolemia, type 2 diabetes mellitus, obesity, preferred mode of consult and willingness to go to the hospital when symptoms get severe. Furthermore, there was a significantly higher percentage of patients who were not admitted in the hospital who consulted less frequently with their cardiologist. There was also a significantly higher percentage of patients who were non-smokers and who don't have Type 2 Diabetes Mellitus who remained compliant with their medications during the pandemic (Table VI and VII). Also, those who didn't have change in the frequency of consult have hypertension and preferred face-to-face consultation (Table VIII).

Discussion

There were 232 patients in this study and majority were aged 60 years old and above (38.5%), female (71.8%) and unemployed (62.4%). According to Jameson et.al, the typical patient with IHD is a male >50 years or a female >60 years of age who complains of typical angina pectoris or chest pain.⁷ Based on the 2019 Philippine statistics, deaths due to IHD were more common among males (58,230) than females (39,240).⁶

IHD was also noted to be prevalent among low-income groups in the United States and Western Europe.⁷ In our study, majority were unemployed. This unemployment could be attributed to lack of physical activity and consequent sedentary lifestyle which is also a powerful risk factor for IHD. The striking result in this study is that majority were non-smokers (76.1%) and only 13.7% were obese contrary to the current knowledge with smoking and obesity being major risk factors in developing IHD.¹

Majority did not have change in the frequency of consultation (57.3%) and most of them have hypertension and preferred face-to-face consultation. This is contrary to the study by Fersia et. al. (2020) wherein all areas of cardiology service provision sustained significant reductions and this included outpatient clinics.¹⁷ For those patients who had decreased frequency of consultation (32.9%), their reasons included fear of contracting COVID 19 (17.5%), lockdown and travel restrictions (12.3%), limited number of patients catered at the clinic (1.3%) and lack of finances (1.3%). Several journals confirmed the presence of medical care avoidance during the COVID 19 pandemic due to the same reasons: fear of contracting the virus as well as community restrictions in order to prevent virus transmission. Despite these, most of the study population still preferred face-to-face consultation (96.6%) over virtual or tele-consult contrary to the current trend of telemedicine across the globe. Those patients who preferred face-to-face consult didn't have change in the frequency of their consult. In a systematic review by Monaghesh et.al. (2020), telemedicine was noted to have

the potential in providing continuous care to the community while preventing direct physical contact and subsequent virus transmission.¹⁹ In a survey made among doctors in the Philippines, more than half (54%) of them claimed that visits to their clinics and patient consultations have significantly reduced and 44% of them adopted telemedicine as part of their practice.²⁰ Majority of the study population claimed to have remained compliant with their maintenance medications (99.1%) however, this is only a self-reported compliance and was not measured objectively. Non-smokers and those who don't have type 2 diabetes mellitus were found to have remained compliant. Majority were willing to go to the hospital if they will experience severe symptom such as chest pain (90.2%). For those who were not willing to go to the hospital despite having severe symptoms (9.8%), the following were their reasons: fear of going out due to COVID 19 (6%), symptoms were tolerable and were not considered emergency (2.6%) and hospitals were in full capacity (0.9%). Only 25.4% of the study population were admitted. Reasons for admission were not included in the study. Those who were not admitted on the hospital were found out to have consulted less frequently.

In conclusion, during the COVID 19 pandemic, majority of patients with IHD did not have any change in the frequency of outpatient consultation with their cardiologist at NDCH. For those who had decreased frequency of consultation, their reasons include fear of contracting COVID 19, lockdown and travel restrictions, limited number of patients catered at the clinic and lack of finances. Moreover, majority preferred face-to-face over telemedicine as mode of consultation. Majority remained to be compliant with their maintenance medications and majority were not admitted in the hospital but those who were not admitted had less frequent consultation. Despite this, majority still agreed that constant follow-up with their cardiologist even during the pandemic is of paramount importance.

Health-seeking behavior is complex and no single method may be used to explain or establish any pattern. The questionnaire made by the researchers may not be applicable in measuring the health seeking behavior of all patients with IHD. Moreover, this is a single-center study and is not representative of the population of patients with IHD in Baguio City. Subsequent research that will be conducted on this matter should be a multi-center study including public hospitals. Factors on why face-to-face consultation was preferred over telemedicine as well as the reasons for admission of these patients during the pandemic should also be explored.

Conflict of Interest. The authors have no conflict of interest to declare.

All co-authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is an original work and is not under review at any other publication.

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Appendix A:**INFORMATION SHEET** *Please shade the circle of your corresponding answer.*

- Age (years) _____
- Gender
- Male
 - Female
- Working Status
- Unemployed
 - Employed
- Weight (kilograms) _____
or (pounds) _____
- Height (centimeters) _____
or (feet & inches) _____
- Smoking history
- Non smoker
 - Previous smoker
 - Current smoker
- Co-morbidities/Other diseases
- Hypertension
 - Hypercholesterolemia
 - Type 2 Diabetes Mellitus
 - Others _____

- Time first diagnosed with ischemic heart disease
- Less than a year ago
 - 1 year ago
 - 2 years ago
 - 3 years ago
 - 4 years ago
 - 5 years ago
 - More than 5 years ago
- Diagnostic tests available:
- 12 lead ECG
 - Total cholesterol
 - LDL
 - HgbA1c
 - 2D Echocardiography
 - Treadmill Stress Test
 - Others _____
- Please enumerate the medications that you are currently taking:
- _____
- _____

Appendix B

QUESTIONNAIRE ON HEALTH SEEKING BEHAVIOR

Please shade the circle of your corresponding answer1. BEFORE the COVID 19 pandemic, how often do you seek consult with your cardiologist?

- Every week
- Every 2 weeks
- Every month
- Every 2 months
- Every 3 months
- More than 3 months
- Others, please specify _____

2. When did you have your last consult with your cardiologist?

- 1 month ago
- 2 months ago
- 3 months ago
- 4 months ago
- 5 months ago
- 6 months ago
- More than 6 months ago

3. DURING the COVID 19 pandemic, how often do you seek consult with your cardiologist?

- Every week
- Every 2 weeks
- Every month
- Every 2 months
- Every 3 months
- More than 3 months
- Others, please specify _____

4. During the COVID 19 pandemic, is there any change in the frequency of your consult with your cardiologist?

- None
- Increased frequency
- Decreased frequency

5. If the frequency of your consult with your cardiologist has increased or decreased during the COVID 19 pandemic, what are the reasons?

6. During the COVID 19 pandemic, what method of consult with your cardiologist do you prefer?

- Face to face consult
- Virtual or tele consult

7. During the COVID 19 pandemic, are you still compliant with your medications?

- Yes
- No
- If no, what are the reasons?

8. During the COVID 19 pandemic, what is the most common symptom that you have experienced?

- Chest pain or heaviness
- Palpitations
- Difficulty of breathing
- Easy fatiguability
- Others

9. If you will experience a severe complaint such as chest pain, are you going to go to the hospital?

- Yes
- If no, what are the reasons?

10. During the COVID 19 pandemic, were you admitted in a hospital?
- Yes
 - No
11. Do you agree that even during the COVID 19 pandemic, you still need constant follow-up with your cardiologist?
- Yes
 - No
 - Not sure
 - Maybe