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SELF-MANAGEMENT OF PATIENTS WITH CARDIOVASCULAR DISEASE IN THE COVID-19 PANDEMIC ERA

Mulyanti Roberto Muliantino[1]*, Yuanita Ananda[2], Emil Huriani[3]
[1,2,3]Faculty of Nursing Keperawatan, Universitas Andalas
*Email korespondensi: mulyantiroberto@nrs.unand.ac.id

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ABSTRACT

Patients with cardiovascular disease were vulnerable population during the COVID-19 pandemic, highest risk of worsening conditions including fatal death when infected of COVID-19. It was related of angiotensin-converting enzyme-2 (ACE2) affinity mechanism which is expressed in the heart. This condition impacted to patients with cardiovascular disease in continue their nursing care and treatment, involves patient self-management. This study aims to analyse the self-management of patients with cardiovascular disease as vulnerable population in preventing COVID-19 infection. This was a descriptive with a cross-sectional study design. We recruited 374 patients with cardiovascular disease in this study. We used the Cardiovascular Self-Management related Covid-19 Questionnaire in data collection. The results showed that mean of total self-management in patients with cardiovascular disease was 77.7 (SD = 9.96), standard precaution was 13.77, self-monitoring blood pressure, cholesterol and blood glucose was 6.73, recognizing disease, symptom & treatment (16.28), attending cardiac dietary education (9.05) and counselling with health professional (13.56). This research is useful for the development of nursing care delivered, in maintaining the continuity and quality of nursing care for patients with cardiovascular disease as vulnerable population of COVID-19 infection.

Keywords: *self-management, cardiovascular, Covid-19*

INTRODUCTION

The coronavirus disease 2019 (COVID-19) spread in 2020 and it lead many countries to instructed stay at home, social distancing and self-isolation to reduce the risk of infection. COVID-19 pandemic brought changing way in providing health care to the patients, also nursing care delivery (Wosik et al, 2020). COVID-19 pandemic infected 94,124,612 patients and it was linked to 2,034,527 deaths in the 223 countries worldwide until January 20, 2021 (WHO, 2021). Based on the data from Indonesian Health Ministry, approximately 1,037,993 cases with 2.8% of *cases fatality rates (CFR)* are spreading in 34 provinces in Indonesia.

Symptoms of COVID-19 were coughing, shortness of breath to respiratory distress and even more fatal resulting of various complications. These condition caused by binding of the viral surface spike protein to the human angiotensin-converting enzyme-2 (ACE2) receptor which expressed nasopharynx, lungs, as well as in the cardiovascular system, gastrointestinal and genitourinary tracts. SARS-CoV-2 counteracting the effects of angiotensin II in the states with excessive activation of renin-

angiotensin system, such as hypertension, congestive heart failure and atherosclerosis (Boukhris et al, 2020).

Patients with cardiovascular disease were highest risk of worsening conditions including fatal death when infected of COVID-19. Based on study from 1527 COVID-19 patients in China, 16.4% patients have cardiovascular co-morbidity and 17.1% with hypertension. This condition closely related with severity of COVID-19 infection and needed of intensive care unit (ICU). Study from 44,672 confirmed cases in Wuhan, showed that high prevalence of patients with cardiovascular co-morbidity (10.5%) comparing with diabetes melitus (7.3%) (Li et al, 2020). In Italia, the data also showed that there was increasing mortality reporting in patient with cardiovascular co-morbidity (Porcheddu et al, 2020).

The study explained that the effect of SARS-CoV-2 infection in cardiovascular include myocardial injury, it was detected by increasing of troponin level. One possible mechanism caused by SARS-CoV-2 infection could be its affinity to ACE2, which is widely expressed in the heart. Others proposed pathway include cytokine storm triggered by an imbalanced response by type-1 and type-2 T-helper cells, sympathetic hyperactivity, hypoxemic myocardial cells damage caused by respiratory dysfunction. Others clinical effect of SARS-CoV-2 infection in cardiovascular were myocarditis, acute coronary syndrome, heart failure and cardiogenic shock, arrhythmias, venous thromboembolism and pulmonary embolism (Boukhris et al, 2020).

Patients with cardiovascular disease have significant impacted in continuing their medication programme including visiting health care service, lack of information about medication programme and process, change of administration and flow in health care service, fear and anxiety of being infected of COVID-19 (acquiring in-hospital infection). therefore, they cancelled their visit to health care service and some of them discontinued their medication programme. This condition was impacted in decreasing health status, quality of life, recurrence events and severe complications of their disease.

Data form *Duke University Health System (DUHS)* showed that there was 33.1% decrease visiting number of cardiac outpatients until June 2020. About 53% visit were cancelled (24,774 from 46,930 visiting of cardiac patients) in 2020. This study found that the COVID-19 pandemic meaning fully impacted outpatients cardiology care (Wosik et al, 2020). The initial study from one of integrated cardiovascular centre in West Sumatera, Dr.M.Djamil Hospital showed that there was decreasing of cardiovascular outpatients during outbreak of COVID-19 pandemic. The data showed the visiting of outpatient before COVID-19 era were 1800-2000 patients per month, and decreased to 800-1000 visiting per month during COVID-19 pandemic. Visiting of outpatients sharply decline in COVID-19 pandemic from 120 visits per day to 40-60 visits per day.

In this current situation, self-management was essential aspect that patients must have and do to manage their disease. Self-management requires knowledge of patients disease process and management, adequate skills to manage and apply patients knowledge into daily living and patients confidence in maintaining self-management behaviour to improve their health status (Barnason et al, 2017). Self-management components of cardiovascular consist of self-monitoring blood pressure, weight monitoring, knowledge of disease, sign, symptom and medication adherence, self-titration of drugs, sleep analysis and hygiene of sleep, dietary education, stress management technique and education and counselling with professional health

(Peterson et al, 2014; Barnason et al, 2017). In COVID-19 pandemic, self-management are essentially needed in facing various challenges of patient to visit health care service as vulnerable population when infected of SARS-CoV-2.

Many studies explained the impact of COVID-19 infection to patients with cardiovascular disease, changing in nursing care and the barriers of health care service and health care delivered during pandemic condition, however there was limited study about self-management of patients with cardiovascular disease as vulnerable population in COVID-19 era. Therefore, the aim of this study was to identify self-management of patients with cardiovascular disease as vulnerable population in the outbreak of COVID-19 pandemic.

METHODOLOGY

This study was descriptive with cross-sectional study design. This study was performed in a public hospital in West Sumatera province in 2021. A total of 374 cardiovascular outpatients participated in this study. Persons with diagnosis of cardiac diseases (hypertension, heart failure, coronary arterial disease, arrhythmias, heart valve disease, cardiac infection) were eligible for this study. Individuals were excluded if they could not complete the questionnaire. This study used consecutive sampling technique.

Data were collected using Cardiovascular Self-Management related Covid-19 Questionnaire consist of 25 questions including standard precaution, self-monitoring blood pressure, cholesterol and blood glucose, weight self-monitoring, disease, symptom and treatment, dietary education, self-titration of drugs, stress management skill, physical activity and life style management, education & counselling with health professional. The socio-demographic questionnaire used to evaluate the age, gender (male or female), marital status (married or unmarried), education level, medical diagnosis, co-morbidity, cardiac intervention has been done (Percutaneous Transluminal Coronary Angioplasty/ Percutaneous Coronary Intervention, heart ablation, pacemaker surgery, rotablation, heart valve surgery etc).

This study was approved by Health Research Ethics Committee of Dr.M.Djamil Hospital (Number: 250/KEPK/2021). This study provided informed consent for all respondents. Data were analysed using descriptive statistics (frequency, percentage, mean and standard deviation).

RESULT AND DISCUSSION

In total, 374 respondents completed the survey. The mean of age of the respondents was 51.03 (SD= 14.7). The majority of the respondents was male (63.9%), were married (86.6%) and have an educational level of senior high school were 174 respondents (46.5%). A total 54.54% respondents were diagnosed Arteriosclerosis Heart Disease (ASHD), majority does not have co-morbidity (78.62%) and a total 122 respondents have experienced in cardiac intervention PTCA/PCI (Table 1).

Table 1. Demographic Characteristics (n=374)

Characteristics	n (%)	Mean ± SD
Age		51.03 ± 14.7
Gender		
Male	239 (63.9)	
Female	135 (36.1)	
Marital Status		
Unmarried	50 (13.4)	
Married	324 (86.6)	
Education Level		
Junior high school	52 (13.9)	
Senior high school	174 (46.5)	
Bachelor/Master/Doctor	148 (39.6)	
Medical diagnosis		
ASHD	204 (54.54)	
CHF	84 (22.46)	
Aritmia	47 (12.57)	
VSD/ ASD	25 (6.69)	
Mitral/ Aorta Stenosis	10 (2.68)	
PDA	4 (1.06)	
Co-morbidity		
Hypertension	27 (7.21)	
Diabetes Melitus	34 (9.10)	
Kidney disease	6 (1.60)	
Other disease	13 (3.47)	
No co-morbidity	294 (78.62)	
Cardiac intervention has been done		
PTCA/PCI	122 (32.6)	
Heart ablation	9 (2.4)	
Pacemaker surgery	30 (8.0)	
Rotablation	23 (6.1)	
Pacemaker	83 (22.2)	
Heart valve surgery	107 (28.6)	

Table 2 shows the mean of total self-management among patients with cardiovascular disease 77.7 (SD= 9.96). Further analysis reported that mean of standard precaution implementation was 13.77, self-monitoring blood pressure, cholesterol and blood glucose (6.73), weight self-monitoring (6.73), identified disease, symptom and treatment (16.28), applied cardiac dietary education (9.05), self-titration of drugs (7.09), implementation of stress management skill (2.98), doing physical activity and life style management (5.76) and join education and counselling with health professional (13.56).

Table 2. ***Cardiovascular Self Management related Covid-19 Questionnaire (n = 374)***

Variabel	Mean	SD
Total Self-Management	77.70	9.96
Standard precaution	13.77	1.94
Self-monitoring blood pressure, cholesterol and blood glucose	6.73	2.47
Weight self-monitoring	2.48	0.88
Disease, symptom & treatment	16.28	3.36
Dietary education	9.05	2.10
Self-titration of drugs	7.09	1.43
Stress management skill	2.98	0.91
Physical activity & life style management	5.76	1.63
Education & Counselling with health professional	13.56	2.23

This study aimed to identification self-management of patients with cardiovascular disease as vulnerable population in the outbreak of COVID-19 pandemic. This study founded the higher medical diagnosis was Arteriosclerosis Heart Disease (ASHD) (54.54%). Further information from this study showed that majority of the cardiovascular outpatient was male and have mean of age was 51 years. Of note, similar risk factors of cardiovascular cases in higher prevalence were increasing in male and age upper than 40 years. Gender and ageing were including unmodified cardiovascular risk factors, that recommended in prediction of risk of cardiac incident and generalised in different populations (Mozaffarian et al, 2008). Previous study about virtual self management of atrial fibrillation patients in COVID-19 pandemic also showed that majority of respondents were older adult (73 years, SD =10) and most of them were male (Rosman et al, 2021).

This study founded that the mean of total self-management in cardiovascular outpatients was 77.7 (SD= 9.96). It was showed that cardiovascular outpatients have self care capabilities to manage their disease in daily living. This study showed more detail implementation every aspect of self-management in cardiovascular outpatients. Further identification of standard precaution implementation founded that cardiovascular outpatients were able to do standard precaution in preventing COVID-19 infection (13.77).

Data from our study showed that cardiovascular outpatients did self-monitoring of blood pressure, cholesterol and blood glucose rarely at home. Perhaps one of the most concerning finding was inaccurate knowledge, lack of equipments and inadequate skill of self-monitoring using equipments. Self-management in cardiovascular requires patients to have knowledge of their disease process, skills to apply this knowledge to their daily life, and confidence that they can sustain self-management behaviour to maintain and improve their health status (Barnason, 2018). Home based programme of self-management in COVID-19 pandemic was given to AF patients and adherence to guideline recommended AF self-management

behaviour, including self-monitoring of heart rate, heart rhythm, and blood pressure, symptom identification and management, and may have broader applications in routine care outside beyond this pandemic. This programme also effective in increasing self-confidence of patients in their disease management (Rosman et al, 2021).

CONCLUSION

In conclusion, outpatients with cardiovascular disease have ability in self management, however they have some difficulty in applying activities related to skills and using equipments. This research provide basic data and information that can be used in making policy for the development of nursing care delivered, in maintaining the continuity and quality of nursing care for patients with cardiovascular disease as vulnerable population of COVID-19 infection. Further research was warranted to determine the education programme of self management skills for patients with cardiovascular disease.

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