THE ANALYSIS OF DIET AND PHYSICAL ACTIVITY PATTERNS IN NURSING MANAGEMENT FOR CORONARY HEART DISEASE PATIENTS

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ABSTRACT

Cardiovascular disease caused by impaired function of the heart and blood vessels, such as coronary heart disease, heart failure, hypertension and stroke caused by improper diet and physical activity patterns. The purpose of this study was to describe the pattern of eating and physical activity patterns in coronary heart disease patients with a history of hypertension. The research method used is descriptive analysis using a cross-sectional approach. The sampling technique used was accidental sampling with a total sample of 130 respondents. The instruments used are Food Frequency Questioinnaire (FFQ) for diet and Global Physical Activity Questioinnaire (GPAQ) for physical activity patterns. The results showed that the picture of the eating pattern in coronary heart disease patients with a history of hypertension was poor diet (53.1%), the description of the pattern of physical activity was the most in the light category (50.0%). Conclusion: In this study, it was found that diet and physical activity patterns in coronary heart disease patients with a history of hypertension were found to have poor diet and light physical activity patterns.

Keywords: coronary heart disease, eating pattern, hypertension, physical activity patterns

INTRODUCTION

Coronary heart disease is a disorder of heart function due to lack of blood due to narrowing of coronary blood vessels which is clinically characterized by chest pain, feeling uncomfortable in the chest or chest feeling depressed by heavy objects (Hert, Detraux, and Vancampfort 2018). Coronary heart disease is an abnormality in one or more coronary blood vessels in which there is thickening in the walls of blood vessels accompanied by plaque that disrupts blood flow to the heart muscle which as a result can interfere with heart function (Wahidji 2022).

Data from the World Health Organization (WHO 2019) shows that 70% of deaths in the world are caused by Non-Communicable Diseases (39.5 million out of 56.4 deaths). Of all deaths due to Non-Communicable Diseases (NCDs), 45% were caused by heart and blood vessel diseases, which is 17.7 million out of 39.5 million deaths. (Kemenkes RI 2018) shows the prevalence of

heart disease based on a doctor's diagnosis in Indonesia is 1.5%, while Central Java (1.8%). The Central Java region itself is in accordance with the health profile of the province of Central Java in 2018, heart disease ranks third in 8 non-communicable diseases in Central Java, which is 9.82%, while for the city of Semarang in accordance with the health profile of the city of Semarang in 2018, the prevalence of coronary heart disease from 2014 to 2018 there was an increase in cases of angina pectoris namely 5532 cases (Kemenkes RI, 2018).

One of the causes of coronary heart disease is hypertension. High blood pressure continuously causes damage to the arterial vascular system slowly. These arteries experience hardening caused by fatty deposits in the blood vessels, thus narrowing the lumen contained in the blood vessels and causing coronary heart disease (Henriques, Amaro, and Piedade 2023).

Efforts that can be made in patients with coronary heart disease are by carrying out self-management which is one of the disease managements in everyday life (Zhu et al. 2022). Based on the Feldman, Campbell, and Wyard (2008) recommendations for hypertension management include modifiability of healthy living behaviors (physical activity, reducing weight, reducing alcohol consumption, diet regulation, limiting sodium, calcium and magnesium diet, doing stress management).

At SMC RS Telogorejo, in 2021 there was an increase in the number of old patients examined at the SMC Heart Poly Telogorejo Hospital. The increase in the number of patients from January 2021 to December 2021 averaged 396 patients per month. Patients with coronary heart disease with a history of hypertension come to the Heart Poly with complaints such as chest pain, high tension, and fatigue. For this reason, it is necessary to do a form of self-care evaluation that has been done independently at home. Based on this description, it is necessary to conduct research on the analysis of diet and physical activity patterns of coronary heart disease patients with a history of hypertension at SMC Telogorejo Hospital.

METHOD

The research method used is descriptive analysis using a crossectional approach. The sampling technique used was accidental sampling with a sample of 130 respondents from a total population of 380 conducted at the SMC Heart Clinic Polyclinic Telogorejo Hospital. This research was carried out in January-April 2022. The instruments used are Food Frequency Questioinnaire (FFQ) for diet and Global Physical Activity Questioinnaire (GPAQ) for physical activity patterns.

The inclusion criteria in this study are patients who are willing to be respondents; patients with coronary heart disease with a history of hypertension; patients aged 35-65 years who can read and write; patients who have been treated at the SMC Heart Poly Telogorejo Hospital. As for the inclusion criteria in this study are patients in emergency conditions who are uncooperative; patients who do not complete the research process; incomplete patient medical records

(illegible/missing) are not included in the study. Data analysis in this study describes respondent data consisting of categorical data (diet, physical activity patterns, age, education, gender and occupation) and numerical data (long suffering from coronary heart disease with a history of hypertension).

RESULTS

The results of a study conducted on 130 respondents at the SMC Telogorejo Hospital showed the following results:

Table 1 Frequency Distribution of Respondents Based on Gender, Age, Education, Occupation at SMC RS Telogorejo (n=130)

Characteristics	Frekuensi	%
Gender		
Male	84	64.6
Female	46	35.4
Education Level		
Elementary School	10	7.7
Junior High School	19	14.6
Senior High School	55	42.3
Vocational	13	10.0
Bachelor	22	16.9
Masteral	11	8.5
Type of Work		
Civil servants	6	4.6
Pension	28	21.5
Housewives	26	20.0
Private employees	23	17.7
Entrepreneurial	23	17.7
Not working	24	185
Total	130	100.0

Based on the distribution table of respondents' frequency, it shows that the distribution of respondents by gender is the most male at 84 respondents (64.6%). The distribution of respondents based on education obtained the most data from high school as many as 55 respondents (42.3%). The distribution of respondents based on occupation obtained the most data, namely pensions of 28 respondents (21.5%).

The distribution of respondents based on the age of respondents, obtained the most age data,

namely the late elderly as many as 93 respondents (71.5%), long suffering from heart disease obtained the most data, namely the length of suffering 1-5 years as many as 86 respondents (66.2%).

Table 2 Dietary Analysis in Coronary Heart Disease Patients with a History of Hypertension

Dietary	F	%	Mean	Standar Deviasi
Good	61	46.9	496.97	42.193
Bad	69	53.1	615.80	34.616
Total	130	100.0		

The distribution of dietary frequency in coronary heart disease patients with a history of hypertension showed that the diet of coronary heart disease patients with a history of hypertension obtained the most data, namely poor eating patterns as many as 69 respondents (53.1%) and mean values (mean) 615.80 with a standard deviation of 34,616; Good diet as many as 61 respondents (46.9%)

Table 3 Distribution of types of food that are often consumed in coronary heart disease patients with a history of hypertension based on Food Frequency Questioinnaire (FFQ)

Types of food	Frequency	%
Carbohydrate Sources		
Creakers	14	21.9
Shrimp Crackers	15	23.4
Bihun Goreng	8	12.5
Biskuit	22	34.4
Roti Tawar	5	7.8
Source of Sodium		
MSG	57	46.3
Kecap	18	14.6
Saos	20	16.3
Gabin Cake	6	4.9
Other Flavoring Spices	22	17.9
Source of fat		
Daging Ayam	15	8.9
Chicken Eggs	7	4.2
Village Chicken Eggs	12	7.1

Types of food	Frequency	%
Sweetened condensed milk	3	1.8
Fried tofu	15	8.9
Coconut milk	5	3.0
Fried tempe	73	43.5
Vegetables tempura	38	22.6

Based on the distribution table of types of food that are often consumed by coronary heart disease patients with a history of hypertension grouped into three food sources, namely carbohydrate sources, namely biscuits as many as 22 respondents (34.4%), sodium sources, namely MSG as many as 57 respondents (46.3%), fat sources, namely fried tempeh as many as 73 respondents (43.5%).

Table 4 Frequency Distribution of Respondents Based on Physical Activity Patterns in Coronary Heart Patients with a History of Hypertension at SMC Telogorejo Hospital

Categories Physical Activity Patterns	Frequency	%
Mild	65	50.0
Moderate	60	46.2
Severe	5	3.8
Total	130	100.0

The results of the frequency distribution of respondents based on physical activity patterns in coronary heart patients with a history of hypertension obtained the results of light activity category as many as 65 respondents (50.0%), moderate activity category as many as 60 respondents (46.2%) and heavy activity category as many as 5 respondents (3.8%).

The average pattern of physical activity in coronary heart disease patients with a history of hypertension based on activity level (METs) obtained the mean value of light activity pattern 363.57 METs, moderate activity pattern 1232.67 METs heavy activity pattern 3808.80 METs.

Table 5 Frequency Distribution Based on Time (Minutes) of Physical Activity in Coronary Heart Disease Patients with History of Hypertension

Types of Physical Activity	Mean	Standar Deviasi	Waktu (Menit)
Physical Activity at Work			
Severe	20.88	10.551	20.88
moderate	21.45	13.281	21.45
Place-to-Place Travel Activities	30.93	30.00	30.93
Recreational Activities			
Severe	26.94	13.189	26.94
Moderate	24.07	10.925	24.07
Sedentary Activities	244.50	165.902	244.50

Information:
1. Recreational Activities: Sports, fitness and other recreation
2. Physical Activity Grouping:
   1. Strenuous Recreational Activities: running, football;
   2. Moderate Recreational Activities: brisk walking, cycling, swimming, playing volleyball

The frequency distribution based on the time /minute of physical activity in coronary heart disease patients with a history of hypertension obtained the mean value of physical activity at work in strenuous activity of 20.88 minutes with a stander deviation of 10.551, in moderate activity 21.45 minutes with a standard deviation of 13.281. Travel activities from place to place obtained an average value (mean) of 30.93 minutes with a standard deviation of 30.00. Recreational activities obtained the mean value in strenuous activity which was 26.94 minutes with a stander deviation of 13.189, in moderate activity 24.07 minutes with a standard deviation of 10.925. Sedentary activity obtained an average value of 244.50 minutes (4 hours) with a standard deviation of 165.902.

DISCUSSION

Based on the results of the research obtained, the sex characteristics of respondents, the majority were male, namely as many as 84 respondents (64.6%). Male gender is a group at risk of coronary heart disease. The results of this study are in line with research conducted by Albinali et al. (2023) that men tend to experience more coronary heart disease and this can be influenced by various factors, including smoking behavior with the results of research on male coronary heart disease patients diagnosed with coronary heart disease by smoking as many as 18 respondents (78.3%).

Men with smoking habits should begin to change the pattern of these habits so as to reduce risk factors for coronary heart disease. Research conducted by in his research said that the highest number of patients with coronary heart disease was male 18 respondents (60%). The risk of coronary heart disease almost becomes the same in the female sex with men after women experience menopause which no longer produces the hormone estrogen (Xiang et al. 2021).

Based on the results of research based on the age of respondents, the most age data was obtained, namely the late elderly as many as 93 respondents (71.5%). This research is in line with research conducted by Madhavan et al. (2018) in his research found that the prevalence of coronary heart disease increased at the age of 45-54 years and over, the highest at the age of 65-75 years by 3.6% over the age of 75 years, decreasing slightly to 3.2%. This is because the development of coronary heart disease begins when the individual is still young and takes up to decades before acute symptoms of coronary heart disease appear.

Age is an important risk factor for coronary heart disease. This research is in line with research conducted by (Kramarow 2021)which states that increasing age the risk of coronary heart disease is higher and starts at the age of 40 years and over. Because as we get older, the function of body organs will decrease due to aging.

The majority of deaths from cardiovascular disease are in individuals 65 years of age or older. This is because the heart undergoes physiological changes even in the absence of previous disease. Physiological changes in the heart that occur with increasing age include the heart muscle will become more rigid, the heart wall thickens, and changes in blood vessels, besides that individuals with the age of 45 years have a 50% greater chance of experiencing coronary heart disease than an easier age (Madhavan et al. 2018).

The results of the respondents' work characteristics research obtained data that most respondents had retired as many as 28 respondents (21.5%), This study is in line with research conducted by Winzer, Woitek, and Linke (2018) in his research most respondents who had poor physical activity were respondents who had a

history of work as a pension by 35.4% in the case group. Based on the results of the interview, respondents with jobs as retirees, have no other physical activity or do not have other additional activities. Länsitie et al. (2022) said that lack of physical activity will increase the risk of coronary heart disease by 2.2 times. The study revealed that regular activity or by exercising regularly can have the effect of increasing blood flow and help break down fat and cholesterol metabolism.

The distribution of respondents based on the length of suffering from heart disease obtained the most data, namely the length of suffering from 1-5 years as many as 86 respondents (66.2%), with an average mean value of 4.77 years with a standard deviation of 3,989. The results of this study are in line with research conducted by Pluta et al. (2020) that the length of suffering from hypertension average value (mean) 4.8 years from 33 respondents. In the study, most suffered from hypertension <5 years, with normal blood pressure (controlled) due to respondents' compliance in taking hypertension medication since being diagnosed with hypertension by a doctor.

Prolonged and uncontrolled hypertension can alter the myocardial structure, blood vessels and conduction system of the heart. These changes will result in left ventricular hypertrophy, coronary artery disease, systolic dysfunction and myocardial diastolic which later manifests clinically as angina, myocardial infarction. Adherence to taking medications and risk factors that can be controlled to achieve blood pressure < 140/90 mmHg and the duration of hypertension <5 years, may prevent changes in the structure of endothelial blood vessels so that myocardial ischemic risk events can be prevented or not occur (Pluta et al. 2020).

Based on the results of the study, the results of diet in coronary heart disease patients with a history of hypertension were mostly in the group of bad eating patterns as many as 69 respondents (53.1%), good diet 61 respondents (46.9%) with an average value of Food Frequency Questioinnaire (FFQ) score of 560.04 with a standard deviation of 70,737. Unhealthy eating patterns such as consuming excess carbohydrates, high fat, high sodium and cholesterol will affect the body and become a risk factor for hypertension, dyslipidemia, diabetes mellitus and coronary heart disease. The results of this study are in line with research conducted by (Ariyanti and Besral (2019) found that from 68 respondents there were 37 respondents (54.45%) whose diet was not good and suffered from coronary heart disease.

In this study using Food Frequency Questionnaire (FFQ) with the contents of the questionnaire using 3 food sources, namely carbohydrate sources, sodium sources, and fat sources. The results of the study based on carbohydrate sources, sodium sources and fat sources obtained the following results:

The results of the carbohydrate source study obtained data on the type of food that is often consumed, namely biscuits as many as 22 respondents (34.4%). Biscuits are one type of carbohydrate that is easily obtained and used as a snack. Biscuits are made from processed flour. Foods processed with flour are foods rich in carbohydrates, which will have an impact on health problems due to the high glycemic index content.

This study is in line with Jo and Park (2023) study, patients who experience coronary heart disease consume excessive carbohydrates and fats. Carbohydrate and fat intake has a significant relationship with lipid profiles in coronary heart disease patients. Coronary heart disease patients who had a high lipid profile were 4.80 times more iron due to excessive fat consumption, and by 2.96 times due to excessive carbohydrate consumption. Someone who consumes excessive carbohydrates can increase body fat which can affect total blood cholesterol levels so that it can increase risk factors for coronary heart disease (Michas, Micha, and Zampelas 2014).

The results of the sodium source research obtained data on the type of food that is often consumed, namely Mono Sodium Glutamate (MSG) as many as 57 respondents (46.3%). This study is in line with research conducted by Thongsepee et al. (2022), consumption of Mono Sodium Glutamate (MSG) has a significant relationship with the incidence of hypertension, where consuming large amounts of sodium will make extracellular increase so that intracellular fluid is excreted which results in increased

extracellular volume, this causes an increase in blood volume which has an impact on hypertension. Continuous consumption of Mono Sodium Glutamate (MSG) will cause hypertension.

Sodium is a trigger for high blood pressure which is a risk for coronary heart disease. Sodium consumption is a risk factor for heart disease, people who often consume sodium have a risk of 1.17 times coronary heart disease compared to people who rarely consume sodium food (Wuopio et al. 2023). The working system of renin angiotensin and aldosterone plays a role in the onset of hypertension. Renin plays a role in the conversion of angiotensin I to angiotensin II which has a vasoconstrictive effect. Angiotensin II causes aldosterone secretion which results in sodium retention.

The results of the fat source study obtained data on the type of food that is often consumed, namely fried tempeh as many as 73 respondents (43.5%). In this study, fried tempeh was included in the category of fat sources, because the processing process was fried. Fried foods contain saturated fat and cholesterol. High fat levels in the blood will cause blockage of blood vessels so that there will be disturbances in the cardiovascular system and can trigger hypertension indirectly.

The results of this study are in line with that coronary heart disease patients who often consume fat sources as many as 62 respondents (56.9%). The higher the consumption of fatty foods, the risk of hypertension and coronary heart disease. High fat consumption can increase fat levels in the blood and result in plaque formation. The plaque will develop into atherosclerosis which results in inelasticity of blood vessels resulting in narrowing of coronary blood flow pressure which causes an increase in blood pressure (Wahidji 2022).

Based on the results of the study, Physical Activity Patterns were obtained in coronary heart disease patients with the most history of hypertension, namely the mild category as many as 65 respondents (50.0%) with an average value (mean) of 363.57 METs with a standard deviation of 177.90 METs. Score in the results of this study is included in the category of light physical activity, where the total physical activity METs minutes per week ≤ 600 METs. The results of this study are in line with research conducted by Rika (2021), it was found that respondents who had a history of coronary heart disease with less physical activity were 10 respondents (43.5%) and the value of OR = 13,333 means that respondents who have less activity are 13 times at risk of having coronary heart disease.

Research conducted by Nugroho, Astutik, and Tama (2022) which found the risk of coronary heart disease in respondents who did light activity by 63.4% compared to respondents who did strenuous activity with a degree of meaning p = 0.001. In his research showed that individuals with low physical activity (82.03%) had a high risk of coronary heart disease, while individuals who did moderate and heavy activity (17.97%) had a lower risk of coronary heart disease.

Physical activity is measured based on Metabolic Equivalents (METs) scores. METs are the ratio of metabolic rate at work to metabolic rate at rest. METs are described in units of kcal/kg/hour. Moderate physical activity adequacy can provide benefits in the prevention of coronary heart disease can be achieved by doing various activities including walking, jogging, using stairs, cycling, swimming, gardening and doing homework (DiPietro et al. 2019).

Based on the Global Physical Activity Questionnaire (GPAQ) results of the time needed in coronary heart disease patients with a history of hypertension in each domain of physical activity, average data were obtained in the span of 20.88 minutes for strenuous physical activity at work, 21.45 minutes for moderate physical activity at work; 30.93 minutes for travel activities from place to place; 26.94 minutes for strenuous recreational activities, 24.07 minutes for moderate recreational activities; and 244.50 minutes or 4 hours for sedentary activities.

According to Thomas et al. (2019) clinical studies show that physical activity can lower the risk of coronary heart disease through mechanisms of preventing or delaying the development of hypertension in normotensive subjects and lowering blood pressure in patients with hypertension, increasing high-density lipoprotein (HDL) cholesterol levels and adipocyte control,

helping to control weight, lowering the risk of developing type 2 diabetes mellitus by improving glucose tolerance and insulin sensitivity, and contribute to muscle strength and mobility that support quality of life. Physical activity for 30 minutes regularly 3-5 days a week can reduce the amount of low-density lipoprotein (LDL) cholesterol up to 10 mg / dL and increase HDL cholesterol up to 4 mg / dL. A significant decrease in overall cholesterol profile and LDL followed by an increase in HDL cholesterol is known to have a positive influence on cardiovascular health.

CONCLUSION

The dietary pattern in coronary heart disease patients with a history of hypertension is included in the bad category as much as (53.1%) and the physical activity patterns in coronary heart disease patients with the most history of hypertension, namely the mild category as much as (50.0%) with an average value (mean) of Global Physical Activity Questionnaire (GPAQ) score of 363.57 METs. The patients knowing the picture of diet and physical activity patterns, as a reference in assessing diet and physical activity patterns so that patients get the right nursing intervention. Explore more deeply about diet such as the amount of food consumed. Calculate the number of calories needed as well as activity patterns such as type of activity and duration of time needed in coronary heart patients with a history of hypertension.

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