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Model of Potential Strengthening and The Role of Family in Control and Modification of Risk Factors in Adult Women with Coronary Heart Disease

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ABSTRACT Coronary heart disease is one of the non-communicable diseases with the highest prevalence in Indonesia. Coronary heart disease incidents can be prevented by controlling modifiable risk factors. Family to help person to survive pressure or keep life in balance. The purpose of this study is to analyze the effect of strengthening family potentials in controlling modifiable coronary heart disease risk factors among women. The research design used a quasi-experimental. The research variable is Coronary heart disease risk control models. The population in this study were families who had adult female family members with coronary heart disease in the work area of Arosbaya Public Health Center in 2019. In the sample in this study, as many as 30 people in each group were taken by simple random sampling. The research instrument used a simulation model for controlling Coronary heart disease risk factors that can be modified for women by the family using module. Analysis used the Kolmogorov Smirnov and pair t-test . The results showed that the mean modification of Coronary heart disease risk factors in among women increased, except for avoidance of cigarette smoke ($p < 0.05$). The pair t-test results show that there is a difference in controlling the risk factors for Coronary heart disease that can be modified after strengthening family potential, except for the avoidance of cigarette smoke. It can be concluded that the implementation of the family potential strengthening model is proven to significantly increase the family's ability to control the risk factors for Coronary heart disease can be modified in among women. It is therefore recommended that to lower the risk of coronary heart disease among women, components of family potentials must be strengthened and employed..

INDEX TERMS Coronary heart disease, risk factors, prevention, strengthening of family potential.

INTRODUCTION

Coronary heart disease is one of the non-communicable diseases with the highest prevalence in Indonesia. The 2016 Heart Disease and Stroke Statistics update of the American Heart Association (AHA) has as of late detailed that 15.5 million people ≥20 years old in the USA have CHD (16), while the announced predominance increments with age for all kinds of people and it has been assessed that roughly at regular intervals, an American will languish over a MI[1]. Women experience greater psychological stress than men. The high level of stress in women is related to physical and mental status, conflicts in the family, household responsibilities, or financial difficulties. The incidence of post-menopause with coronary heart disease who received hormone-vitamin E-vitamin C replacement therapy showed a tendency for higher cardiovascular mortality. Women have less blood volume and stroke volume than men, so it is necessary to increase the heart rate to maintain adequate cardiac output. For individuals who matured 40 years, the lifetime hazard of creating CHD was 49% in men and 32% in ladies though, for those arriving at age 70 years, the lifetime risk was 35% in men and 24% in ladies. Then again, for all-out coronary occasions, the frequency rose steeply with age, with ladies lingering behind men by 10 years while for the more genuine signs of CHD, for example, MI and abrupt passing, ladies falled behind men in occurrence by 20 years, however, the sex proportion for rate-limited dynamically with propelling age[1]

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The incidence of CHD can be prevented by controlling the risk factors for CHD that can be modified. Family is the strength for a person to survive pressure or maintain a balanced life. Family strength can be owned because of the various potentials they have. Living as a family amidst persistent sickness likewise implies zeroing in on the present while as yet having thought for the past and what's to come. As per the hypothesis by HEC, this can be perceived as the family reaching out to their family design according to a diachronic viewpoint. Consequently, they can arrive at another degree of adjustment and vision for the future and feel positive about their future as opposed to zeroing in on this tough spot[2].

To prevent the increase in the prevalence of CHD in women, it is necessary to strengthen all the potential that the family has. The strength of family potential can be in the form of family values, family support, and proactive coping to convince oneself of the ability to face the threat of CHD to women. Family strengthening can be done by promoting the promotion of CHD control. Promoting CHD control does not have to be done by health workers but can be family members. The results of Fitriah's (2021) research show that the anticipatory persuasive promotion model is quite effective in increasing the family's ability to prevent CHD. [3] This is in line with the government program with a family approach model to increase target coverage and bring closer access to health services. There is no study about family potential strengthening in coronary heart disease.

II. METHODS

The research design used was a quasi-experimental design with A non-equivalent control group design. This design consisted of two groups, namely the experimental group and the control group each of which was given a pretest and posttest. The research variables used were exogenous variables and endogenous variables. Exogenous variables, namely the risk control model for CHD in adult women that has been determined through FGD in previous studies include filial values, family support, and a proactive attitude towards controlling the risk of CHD in adult women.

The population in this study were families who had adult female family members with coronary heart disease in the work area of Arosbaya Health Center in 2019 who were recorded at Anna Medika Hospital as the first referral as many as 5-10 families a day. The sample in this study is a family of adult women with coronary heart disease who live in the working area of the Arosbaya Bangkalan Health Center. The criteria for inclusion, exclusion, and dropout in this study were as follows: a family is a nuclear or extended family, and one or more family members are adult women. Meanwhile, the exclusion criteria in this study were families with health problems with complications and families who did not live in the same house. The criteria for resigning/dropping out were that the family did not follow the procedure and withdrew from the study. Sampling using simple random sampling or random sampling, to represent the population determined by the researcher with a sample size of 30 people in each group

The research instrument used is a model simulation of CHD risk factor control that can be modified for women by the family using modules that have been compiled based on the results of previous studies and FGDs for family education in controlling CHD risk factors can be modified for women. The trial implementation of this model is to prove the ability of families to control the risk factors for CHD can be modified in women. Bivariate statistical analysis was obtained with a computer device using the Kolmogorov Smirnov statistical test and homogeneity with variance. Then look for the mean value of each, the standard deviation and deviation of the control and treatment groups then tested by pair t-test

III. RESULT

1. CHARACTERISTICS OF RESPONDENTS

The following is a description of the characteristics of the treatment and control group respondents, which are described in TABLE 1.

TABLE 1
Characteristics of Treatment and Control Respondents

No	Characteristic	Treatment Grup		Kontrol Grup	
		F	%	F	%
1	**Education**				
	a. SD-SMP	13	52	10	40
	b. SMA	10	40	12	48
	c. PT	2	8	3	12
	Total	25	100	25	100
2	**Pekerjaan**	F	%	F	%
	a. Private	7	28	8	32
	b. Enterpreneur	15	60	14	56
	c. PNS/TNI/Polri	3	12	3	12
	Total	25	100	25	100
3	**Number of family**	F	%	F	%
	a. 2-3	9	36	7	28
	b. 4-5	12	48	13	52
	c. > 6	4	16	5	20
	Total	25	100	25	100
4	**The existence of a smoking family**	F	%	F	%
	a. Smooking	15	60	16	64
	b. Non Smooking	10	40	9	36
	Total	25	100	25	100

The characteristics of the families who are the most respondents in the study are having an education at the SD-SMP level, an entrepreneurial job (farming, trading) with the largest number of family members being 4-5 people, and more than half of the family members who smoke.

2. NORMALITY TEST

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The results of the calculation of the normality test using the Kolmogorov-Smirnov formula are obtained as follows:

Based on the results of the normality test in the treatment and control groups described in TABLE 2, it is known that all indicators of the risk factor control variable can be modified, only the variable avoidance of non-normal cigarette smoke, with a sig value of 0.001 <0.05.

TABLE 2
Summary of Data Normality Test

Variable	Treatment Grup		Control Grup	
	Asymp. Sig.	Decision	*Asymp. Sig.*	Decision
Physical activity	.665	Normal	.665	Normal
Control Weight and Blood Pressure	.363	Normal	.360	Normal
Stress manage	.393	Normal	.390	Normal
Control of food patterns and types	.305	Normal	.696	Normal
Avoid cigarette smoke	.001	Normal	.005	Abnormal

3. MODIFICATION OF CHD RISK FACTORS FOR WOMEN BASED ON STRENGTHENING FAMILY POTENTIAL

The analysis by conducting pre-test and post-test testing of the treatment and control groups aims to determine whether there is an increase in the score. The conclusion of the study was declared significant if p <0.05 with a significance of 5%.

Based on TABLE 3, it can be seen that the average modification of CHD risk factors in adult women has increased, except for avoiding cigarette smoke, there is no change in the average ability. Based on the p-value, it is known that an increase in the family's ability to control risk factors can be modified. The significance value is p <0.05, which means that there is a significant difference between the pre-test and post-test in the treatment group. The ability of the family is better after being given the strengthening of the potential in controlling CHD risk factors that can be modified in adult women in the prevention of CHD. But it does not give an increase in cigarette smoke avoidance with no difference in the average pre and post-treatment. Conversely, there was no significant change in the control group with a p value> 0.05 for all abilities.

While the differences between the treatment group and the control group are described in TABLE 4 below
Based on TABLE 4, it is known that there are differences between the control group and the treatment group in controlling the risk factors for CHD that can be modified after strengthening family potential, except for the avoidance of cigarette smoke. There was no difference in control behavior in both the control and treatment groups.

TABLE 3
Wilcoxon Pre-Test and Post-Test Treatment Group Results

1. Physical activity

		Mean	SD	p	CI 95% Lower	CI 95% Upper
Treatment	**Pre**	6.04	2.879		4.85	7.23
	Post	7.16	2.340	,000	6.19	8.13
		1.06				
Kontrol	**Pre**	6.04	2.879		4.85	7.23
	Post	6.06	2.880	,060	4.90	7.24
		0.02				

2. Control Weight and Blood Pressure

		Mean	SD	P	CI 95% Lower	CI 95% Upper
Treatment	**Pre**	6.80	2.345		5.83	7.77
	Post	9.00	2.273	,010	8.06	9.94
		2.20				
Kontrol	**Pre**	6.80	2.345		5.83	7.77
	Post	6.80	2.159	,052	6.03	7.78
		0.02				

3. Stress Manage

		Mean	SD	P	CI 95% Lower	CI 95% Upper
Treatment	**Pre**	9.00	2.273		8.06	9.94
	Post	9.92	1.470	,010	9.31	10.53
		0.92				
Kontrol	**Pre**	9.00	2.273		8.06	9.94
	Post	9.12	2.068	,180	8.27	9.97
		0.12				

4. Control of food patterns and types

		Mean	SD	P	CI 95% Lower	CI 95% Upper
Treatment	**Pre**	8.08	2.326		7.12	9.04
	Post	8.52	1.896	,050	7.74	9.30
		0.44				
Kontrol	**Pre**	7.12	1.936		6.80	8.40
	Post	7.50	1.691	,100	7.42	8.82
		0.38				

5. Avoid cigarette smoke

		Mean	SD	P	CI 95% Lower	CI 95% Upper
Treatment	**Pre**	0.60	.500		.39	.81
	Post	.0.60	.500	1,00	.39	.81
		0				
Kontrol	**Pre**	0.48	.510		.27	.69
	Post	0.48	.510.		.27	.69
		0				

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TABLE 4
The Significance of Controlling Risk factors for CHD can be modified based on treatment with controls

Variable	Asymp. Sig. (2-tailed)	Decision
Physical activity	.040	Difference
Control Weight and Blood Pressure	.030	Difference
Stress manage	.040	Difference
Control of food patterns and types	,010	Difference
Avoid cigarette smoke	,074	No Difference

IV. DISCUSSION

The family potential strengthening model is based on family resources, filial values, support, and proactive coping in the family to control the risk factors for CHD can be modified in adult women. The filial value consists of giving respect, responsibility, the ability to care for, and a sense of filial piety to be able to influence the control of CHD risk factors that can be modified in adult women which consists of maintaining the pattern and type of food, regulating physical activity, avoiding cigarette smoke, controlling body weight and blood pressure. and blood fats and stress management. Modification of coronary heart disease risk factors associated with filial values, family support, and proactive attitudes of 85.2% while the remaining 14.8% is influenced by other variables not included in this research model.

WHO recommendations regarding CHD control measures become a reference in the handling of CHD patients. Individuals who are at risk of developing CHD are advised to take independent lifestyle measures aimed at minimizing the risk factors that exist in the patient. Patients who are active smokers are advised to quit, and patients who are obese and overweight are advised to lose and control their weight. Patients also have to change their diet to be healthier by consuming low-fat foods. Patients who have a habit of consuming alcoholic beverages are advised to reduce it. Lack of physical activity must also be increased.

The first indicator of modifiable CHD risk factor control in adult women is control of food patterns and types. The control factor for pattern and type of food is significant as a control for risk factors. Based on research data in table 3, it is known that the control pattern of CHD risk factors can be modified in adult women to indicators of maintaining the pattern and type of food more than the average in the sufficient category, even being found in the underprivileged category. This description of the control patterns and types of food shows that the ability to control CHD risk factors can be modified is still lacking.

CHD is a case of heart disease due to narrowing or blockage of the coronary arteries due to atherosclerosis so that blood flow is greatly reduced to the heart muscle tissue. k factors for CHD that can be modified include hypertension, diabetes mellitus, dyslipidemia, lack of physical activity, unhealthy diet, smoking, and stress [1]. Among these risks, hyperlipidemia is closely related to nutrient consumption patterns. Diet is a way for a person to meet his body's needs by consuming various types of food, frequency, and type, the diet itself is influenced by the level of nutritional knowledge, awareness, and e omic capacity of a person[2]. Quoted to Man & Truswell there is a change in a person's diet from time to time, this is due to a large number of new foods and new menus that are adopted from other traditions as a trigger for changes in people's diet.[4]
Mann & Truswell explained that the factors that play a role in diet and consumption of types of food are socio-cultural factors and the smallest social environment is the family, where the family consists of a mother, father, and child.[5] In the environment, there is a key kitchen person (KKP), usually, the regulator of household food needs is the mother, therefore the role of the mother in managing diet and eating habits is very important. The mother has a role as a regulator and is a risk group for CHD, so the role of the family is to carry out health duties. Health duties will run well if the family has filial values. Maternal health is a family responsibility, caring for and keeping the mother healthy is devotion and respect. This means that filial values that affect the control of CHD risk factors can be modified in adult women.[4]

The second indicator of controlling CHD risk factors that can be modified in adult women is physical activity. Significant physical activity as a modifiable control factor for CHD risk factors in adult women. The data in table 3 shows that the ability to control CHD through physical activity is on average in the very capable category. This means that there is an opportunity to control risk factors for CHD that can be modified from indicators of adult female activity.

It is advisable to do physical exercise (exercise) at least 30 minutes every day for 3-4 days a week (rest intervals a day) so that maximum results can be achieved. Physical activity or regular exercise can incr HDL and help metabolic processes. Regular aerobic activity reduces the risk of CHD by 20-46%. Physical activity will improve the work system of the heart and blood vessels by increasing the efficiency of the work of the heart, reducing complaints of chest pain, dilating blood vessels, making cholesterols or new pathways when there is already narrowing of the coronary arteries, preventing blood clots, increasing sexual ability, and increasing physical fitness. [6]
The chances of modifying risk factors in adult women are great with the average data being very capable. This is related to several research results. All cases of mortality were lower in the proportion of women who were diligent in physical activity[7]. Women who are mostly married and become housewives are classified as jobs with light physical activity at risk of obesity[8] and high levels of triglycerides in women are due to lack of physical activity [9]. CHD risk can be the strongest reduced by vigorous activities and total physical activity. [7][10]

Based on the above, the role of the family is to encourage mothers, and adult women in the house to do many activities. Health problems experienced by a person cannot be seen from the perspective of the patient as an individual but must be seen from the perspective of the individual as a family member because the individual lives in the context of his family. The problem of the risk of developing CHD in adult women is not only a woman's problem but also a family problem. The Parenting Empowerment Model explains the background that affects the situation of providing care by the family, it is a Filial Value, which consists of an attitude of responsibility, respect, and the ability to care for.

The third indicator in controlling CHD risk factors that can be modified in adult women is controlling body weight and blood pressure. Almost all families said that they were unable to control their weight and blood pressure. This of course will be a complicating factor in controlling the risk factors for CHD that can be modified in adult women. It is known that mothers rarely even weigh or take blood pressure measurements. Even mothers do not try to adjust their diet and activities if they feel that obesity has occurred.

Obesity is a modifiable risk factor and is an important key in the increasing incidence of CHD. Weight gain can significantly increase the incidence of coronary disease. Yuliani, Oenzil, and Iryani explain that there is a relationship between obesity and CHD cases. Adults who are obese and have other risk factors for cardiovascular disease such as high blood pressure, high cholesterol, or high blood sugar should make lifestyle changes to lose weight. [11] CHD can be increased with a dietary pattern.[12] [13]. Based on the results of this study, researchers argue that obesity can increase the risk of CHD. Implementing a healthier lifestyle and losing weight is expected to prevent and reduce the risk of CHD as a form of family service for women.

The importance of controlling blood pressure is because the number of CHD patients with a history of hypertension is more than those without hypertension. Women with a background marked by hypertension in pregnancy, including toxemia, contrasted and the people who were normotensive while pregnant, have an expanded risk for creating hypertension after age 40, and they foster it prior throughout everyday life. They were likewise bound to have CHD, yet changed gambles were not essentially unique, proposing that the relationship between hypertension in pregnancy and CHD might be to some extent intervened by conventional dangerous factors, including a more serious gamble of hypertension. Conversely, the expanded risk for stroke in ladies who announced hypertension in pregnancy remained essentially raised, even in the wake of controlling for customary gambling factors, including the more serious gamble of hypertension[14] So one of the applications of family values (filial values) is that families can provide care to women as a group at risk of CHD by reminding and encouraging them to be diligent in controlling body weight and blood pressure.

The fourth indicator in controlling CHD risk factors that can be modified in adult women is managing stress. It is known that managing stress is a significant indicator for controlling modifiable CHD risk factors in adult women. The data shows that the family's ability to manage stress in each category, both very capable, capable, and poor, has almost the same percentage. Assessment of the ability to manage stress includes what the family has not fully been able to do think positively in response to every problem, relax when facing family burdens, prepare relaxing time with family and return all matters of life to destiny.

Women experience greater psychological stress than men, high stress on women is associated with comorbidities, physical and mental status, conflicts in the family, household responsibilities, or financial difficulties. Depression has a strong association with the incidence of fatal CHD in women aged 30-55 years, who previously had no history of CHD [15].

To improve the health status of adult women, to avoid CHD is to control stress. An effective way for families to do this is to help adult women manage stress. Families can use stress management principles by the values in the family (filial values). Stress management by filial values has an effective impact on psychological resilience, which will be realized if the family can overcome non-physical problems, control positive emotions, positive self-concept, and care for husbands for their wives. Family members also cooperate, respect, and are responsible for all family matters to realize family welfare By-Law No. 52 of 2009, that family development aims to improve the quality of the family to create a sense of security, peace, and hope for a better future in realizing physical well-being and inner happiness.

The fifth indicator of controlling CHD risk factors that can be modified in adult women is avoidance of cigarette smoke. Avoidance of cigarette smoke is a significant indicator in controlling risk factors. The data shows that most of the families that can avoid cigarette smoke are in the quite well-off category even in the poor category. This data is relevant to the characteristics of families, most of which have family members who smoke.

The results of this study showed that the number of passive smokers was 82.9%. In previous studies, it was explained that the results of statistical tests between exposure to heavy cigarette smoke have a relationship to the incidence of CHD in women of productive age. A person who smokes will release nicotine and tar substances even twice as much as what active smokers inhale themselves, and if these substances are inhaled by other people it will increase the risk by 20 to 30% for CHD[16]. Exposure to other people's smoke increases the risk of heart disease even in non-active smokers. So the researchers argue that women as passive smokers are also very at risk of CHD. To avoid the risk of CHD, awareness of other family members is needed, and respecting the right to a healthy life is a family value perspective

WHO recommendations regarding CHD control measures become a reference in the handling of CHD patients. They not only receive drug therapy that they must regularly consume but are also encouraged to take

independent lifestyle measures aimed at minimizing the risk factors that exist in patients. Individuals who are active smokers are advised to quit, and individuals who are obese and overweight are encouraged to lose and control their weight. Women also have to change their diet to be healthier by consuming low-fat foods. Lack of physical activity must also be increased.

The factor that also greatly influences the prevention of coronary heart disease is family support. According to someone who has CHD, it can affect the family system as a whole. This is due to the changing role of the family because a family member is sick. When CHD patients undergo a cardiac rehabilitation program, the family plays a dominant role. Substantial proof shows that diets utilizing nonhydrogenated unsaturated fats as the transcendent type of dietary fat, entire grains as the principal type of starches, a wealth of leafy foods, and satisfactory omega-3 unsaturated fats can offer huge assurance against CHD. Such eating regimens, along with normal active work, aversion to smoking, and support of solid body weight, may forestall most cardiovascular sickness in Western populaces.[17] Programs with three separate foci were distinguished: (1) Programs that guide relatives in defining objectives for supporting patients in taking care of themselves and ways of behaving have prompted superior execution of family support jobs, yet have blended achievement working on understanding results. (2) Programs that train families in strong correspondence procedures, like inciting patient adapting strategies or utilization of independence steady proclamations, have effectively further developed patient side effects the board and wellbeing ways of behaving. (3) Programs that give families devices and framework to help with checking clinical side effects and meds are being led, with proof to date on their effect on persistent results.[18] The results of this study are also in line with previous research which explains that family members who are involved in the family-based foot care education program are selected by respondents based on the person closest to the respondent and who lives at home. Thus, family members can become a support system for patients in carrying out foot care behaviors

The ability to take control measures for CHD requires proactive coping to deal with the disease. Greenglass states that proactive coping is directed by a proactive attitude.[19] This attitude is a relatively constant belief in each individual, where if there are changes that have the potential to disrupt the balance of the individual, this attitude can improve themselves and their environment. Proactive coping can be demonstrated in many ways, the ability to integrate plans, and preventive strategies in a proactive way, be able to identify and use social resources, and be able to use problem-solving proactively emotionally.

Proactive coping was a halfway middle person of social help on sure effect and that positive influence was related with better mental working.[19]
Social well-being shows a positive correlation with proactive coping strategies, future-oriented time perspectives, positive emotional expression and negative emotional regulation, different thinking, and open communication with parents [20].

Lifestyle intervention is carried out by all women not to smoke or to stop smoking, both passive and active, and carry out routine activities. Follow a healthy diet, and maintain ideal body weight and abdominal circumference by maintaining a balance between calorie intake and physical activity. The intervention of major risk factors is blood pressure control, betes management, and achieving optimal lipid levels delaying the development of heart failure in susceptible women. All efforts to control risk factors can be modified to prevent women from experiencing CHD. Women in controlling risk factors cannot alone without a strategy. For this reason, a proactive coping strategy with family is needed, namely by actively making improvements in lifestyle.

The incidence of CHD in women is not sudden, but due to risk factors. And the existence of modifiable CHD risk factors must become a reference for families to be oriented toward health in the future by developing the resources owned by the family. Families must build self-awareness that the ability to maintain health is their responsibility, and based on the family's desire to change themselves for the better. So that it can be seen the importance of family proactive coping in controlling the risk factors for CHD in adult women.

V. CONCLUSION

The model for strengthening family potential needs to pay attention to resources, filial values, support, and proactive coping in controlling CHD risk factors that can be modified in adult women. Control of risk factors for heart disease can be modified directly, the strongest is determined by the factor of proactive family attitudes. The strongest modifiable indirect factors in controlling heart disease risk factors are filial values and family proactive coping. Family resources also have the greatest influence through filial values and a proactive family attitude. Activities to prevent morbidity and mortality due to CHD in adult women can be carried out by controlling risk factors that can be modified by involving all components of the family so that the whole family has a sense of responsibility and concern for the health of others family members. Policyholders in implementing non-communicable disease (PTM) prevention programs need to use a family-centered care approach.

The implementation of the family potential strengthening model is proven to significantly increase the family's ability to control the risk factors for CHD can be modified in adult women. The implementation of the PTM prevention program with PJK as one of the PTM is not always carried out by health workers, but the strategy of involving all family members is further enhanced through a program of strengthening the potential of the family.

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