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Education of Heart Attack Prevention and Heart Disease Risk Stratification in Banyumas Regency

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Abstract

Every year more than 36 million people die from non-communicable diseases (NCD), which is about 63% of deaths caused by NCDs. Globally, PTM which is the number one cause of death every year is cardiovascular disease that can occur before the age of 60 years, and 90% of these premature deaths occur in low and middle income countries (Kemenkes RI, 2014). In Central Java Province, based on reports from hospitals, the highest cases of coronary heart disease were in the city of Semarang, amounting to 4,784 cases (26.00%) compared to the total number of coronary heart disease cases in other districts/cities in Central Java. When viewed based on the total number of other PTM cases in Klaten Regency, it was 3.82%. Meanwhile, the second highest case was Banyumas Regency, which was 2,004 cases (10.89%) and when compared to the total number of other PTMs in Banyumas Regency, it was 9.87%. The fewest cases were found in Tegal Regency, namely 2 cases (0.01%) (Health Profile of Central Java Province, 2014). This study aims to determine the effect of education on heart prevention efforts on the stratification of heart disease. This type of research is quasi-experimental with pre and post test designs with controls. The number of samples is 40 respondents, 20 samples as the intervention group and 20 respondents as the control group. The results of the dependent t test analysis showed that there was an effect of education on prevention of heart disease on the reduction of heart disease stratification with p value: 0.00. There is an effect of education on prevention of heart disease on reducing the stratification of heart disease.

Keywords
Stratification of heart and blood vessel disease; prevention efforts

I. Introduction

Non-communicable diseases (NCDs) every year cause 36 million more people to die. One of the PTM that causes death is cardiovascular disease which can occur before the age of 60 years, and most of these premature PTM deaths occur in low- and middle-income countries (Kemenkes RI, 2014).

Besides that, cardiovascular disease, including coronary heart disease (CHD) has become a problem in both developed countries where treatment and disease prevention services are also more advanced. Similar problems are currently happening in developing countries, so it is projected that in the future cardiovascular disease will become the main cause of death in developed and developing countries (Kemenkes RI, 2014).

According to Libby, Bonow, Mann, Zipes, and Braunwald (2008), 80% of deaths from heart and blood vessel disease are deaths that are not known to have previously suffered from heart and blood vessel disease. Therefore, it is necessary to detect the risk of heart and blood vessel disease early through the detection of risk factors, estimate the level

of risk so that it can be studied further, monitored and given appropriate interventions (Marteau-Kinmonth, 2002; Libby et al., 2008; Sobbry, 2011).

The same thing with the Ministry of Health RI Directorate General of PP & PL (2011), Billy et al. (2008), Marteau-Knimonth and Sobbry (2002) stated that one way to control heart and blood vessel disease is to control risk factors through early detection of risk factors and treatment of these risk factors.

Cardiovascular disease is a disease caused by impaired function of the heart and blood vessels such as CHD, heart failure and hypertension. Cardiac arrest is a complication of the impaired function of the heart and blood vessels (Kemenkes RI, 2014).

Out-of-hospital cardiac arrest (OHCA) is a leading cause of death and disability and is a disease that costs a lot of money in the United States. Nearly 500,000 deaths per year in the United States are associated with sudden cardiac arrest, and 47% of them occur outside the hospital (Bremer, et al., 2012; Stiel, et al., 2004; Hasselquist, et al., 2015).

In Indonesia the OHCA data is still unclear. However, data from the Ministry of Health of the Republic of Indonesia in 2013 showed that the incidence of CHD at the age above 15 years was 883.447 cases. With the incidence in Central Java of 120,447 cases, it can be seen in table 1 below.

Table 1. Estimation of Patients with Coronary Heart Disease at Age ≥ 15 Years by Province in 2013

No	Provinsi	% Diagnosis Dokter (D)	% Diagno-sis/Gejala (D/G)	Estimasi Jumlah Absolut (D)	Estimasi Jumlah Absolut (D/G)
1	Aceh	0,7	2,3	22.240	73.073
2	Sumatera Utara	0,5	1,1	44.698	98.336
3	Sumatera Barat	0,6	1,2	20.567	41.133
4	Riau	0,2	0,3	8.214	12.321
5	Jambi	0,2	0,5	4.625	11.563
6	Sumatera Selatan	0,4	0,7	21.919	38.358
7	Bengkulu	0,3	0,6	3.748	7.495
8	Lampung	0,2	0,4	11.121	22.242
9	Kep. Bangka Belitung	0,6	1,2	5.669	11.338
10	Kep. Riau	0,4	1,1	5.476	15.058
11	DKI Jakarta	0,7	1,6	53.265	121.748
12	Jawa Barat	0,5	1,6	160.812	514.597
13	Jawa Tengah	0,5	1,4	120.447	337.252
14	DI Yogyakarta	0,6	1,3	16.663	36.104
15	Jawa Timur	0,5	1,3	144.279	375.127
16	Banten	0,5	1,0	40.370	80.740
17	Bali	0,4	1,3	12.272	39.885
18	Nusa Tenggara Barat	0,2	2,1	6.405	67.257
19	Nusa Tenggara Timur	0,3	4,4	9.350	137.130
20	Kalimantan Barat	0,3	0,9	9.218	27.653
21	Kalimantan Tengah	0,3	1,7	4.825	27.340
22	Kalimantan Selatan	0,5	2,2	13.612	59.892
23	Kalimantan Timur	0,5	1,0	13.767	27.535
24	Sulawesi Utara	0,7	1,7	11.892	28.880
25	Sulawesi Tengah	0,8	3,8	14.888	70.719
26	Sulawesi Selatan	0,6	2,9	34.434	166.429
27	Sulawesi Tenggara	0,4	1,7	6.158	26.170
28	Gorontalo	0,4	1,8	3.019	13.584
29	Sulawesi Barat	0,3	2,6	2.402	20.817
30	Maluku	0,5	1,7	5.308	18.049
31	Maluku Utara	0,2	1,7	1.436	12.208
32	Papua Barat	0,3	1,2	1.672	6.690
33	Papua	0,2	1,3	4.298	27.936
	INDONESIA	**0,5**	**1,5**	**883.447**	**2.650.340**

Source: Processed based on 2013 Basic Health Research data, Research and Development Agency of the Ministry of Health of the Republic of Indonesia and Target Population Data, Center for Research and Development of the Ministry of Health of the Republic of Indonesia

In Central Java Province, based on reports from hospitals, the highest cases of coronary heart disease were in the city of Semarang, amounting to 4,784 cases (26.00%) compared to the total number of coronary heart disease cases in other districts/cities in Central Java. When viewed based on the total number of other PTM cases in Klaten Regency, it was 3.82%. Meanwhile, the second highest case was Banyumas Regency,

which was 2,004 cases (10.89%) and when compared to the total number of other PTMs in Banyumas Regency, it was 9.87%. The fewest cases were found in Tegal Regency, namely 2 cases (0.01%) (Health Profile of Central Java Province, 2014).

Based on a preliminary survey conducted by researchers in the working area of the Kedungbanteng Health Center and East Purwokerto Health Center, it was found that from 200 active elderly members, almost 70% (140 people) suffered from hypertension, 65% (130 people) BMI exceeded the normal rate, 98% (196 people) smoked, and 20% (40 people) had DM. In addition, scheduled sports activities such as elderly gymnastics are only carried out once a month guided by a village midwife, so that structured exercise is still in low condition. The results of the preliminary survey above show that the risk factors in the community for coronary heart disease (CHD) are still very dominant.

Considering that CHD is one of the risk factors for cardiac arrest, this requires special attention in the prevention and treatment of cardiac arrest, especially those that occur outside the hospital (Kemenkes RI, 2014 & Bremer., et al, 2012).

To recognize and detect CHD early, heart disease stratification (scoring) is used. This scoring instrument has been developed as an effort to determine the classification of heart disease risk. For exampleSCORE (Systemic Coronary Risk Estimation), the 2011 ESC (European Society of Cardiology) guidelines recommends the use of SCORE for cardiovascular risk estimation in the next 10 years. By using SCORE, individuals are grouped into very high risk groups, high risk groups, moderate risk groups, and low risk groups. Starting from this classification, follow-up intervention strategies are carried out in the form of lifestyle modification and drug therapy if needed (Myrtha, 2013).

There is another stratification of the Framingharm Risk Score which is the result of the Framingharm Heart Study which is an important milestone in the practice of preventive cardiology which produces the concept of risk assessment and assessment and prediction of CHD in asymptomatic individuals based on practical, relevant, minimal predictors but considered quite accurate. An easy way of calculating is made so that users can use a risk factor calculator model and produce a certain value or score and a predictive percentage figure for certain cardiovascular disease events known as the framingharm risk score which has inspired many parties to use, validate or create a calculation system (Framingham Heart Study, 2012).

Some countries or groups of countries apply the calculation model with the framingharm risk score, but they find that the model lacks accuracy for certain countries, groups of countries or population or ethnic groups, thus stimulating further epidemiological research efforts and validation and creating other scoring systems that are considered more accurate for each group.

In Indonesia, a model has been developed to assess the risk stratification of CHD or heart attack by Prof. Dr. dr. Dede Kusuma, also known as the Jakarta Cardiovascular Score. This study was conducted for 13 years using a historical cohort study technique with a sample size of 268 women and 211 men. Calculations or calculates the 10-year risk of cardiovascular mortality rate with an age range of 25 – 64 years and the predictors include gender, age, systolic BP, BMI, smoking, diabetes, and physical activity. The sensitivity of this instrument is 77.9%, specificity 90.0% and positive predictive value 92.2%, negative predictive value 72.8%.Interpretation of results includes 7-1 Low Risk (CV10 < 10%),2-4 Moderate Risk (CV10 = 10-20%) and > = 5 High Risk (CV10 > 20%. (Jakarta Cardiovascular Score,https://sourceforge.net/projects/skorkardiojkt/accessed 23 September 2016).

Primary and secondary prevention efforts are carried out with various guidelines made, especially to direct which individuals should receive more intensive treatment than

others so that this treatment is carried out using the cost effective principle. This principle is very important especially for developing countries or countries with limited resources and manpower.

Nurses who are an integral part of health services have a role in controlling heart and blood vessel disease, namely by detecting risk factors for heart and blood vessel disease and predicting risks so that appropriate interventions can be given (Halcomb, Davidson, Yallop, Griffiths, & Daly, 2007).

II. Research Method

This research is a quantitative research with the type of research using the quasi experiment method. Research design is a vehicle for achieving research objectives, which also acts as signs that will guide researchers throughout the research process (Sastroasmoro & Ismael, 2011).

The research design used was Pretest-Posttest Design with control group. This design is used to compare the results of the intervention in a group measured before and after treatment.

1. Population

The population is a large number of subjects who have certain characteristics (Sastroasmoro & Ismael, 2002). The population in this study were all people in the working area of the East Purwokerto Health Center and Kedung Banteng Health Center, married adults (predicted age 40 years) who were active in posyandu activities for the elderly were 420 people.

2. Sample

The sample is part of the number and characteristics possessed by the population (Sugiono, 2004), or the sample is part or representative of the population under study. The sampling technique in this study was random sampling.

III. Results and Discussion

3.1 Characteristics of Respondents

Research on the effect of education of heart disease prevention on heart disease stratification in the Banyumas Regency was conducted from August 01 to September 30, 2017. The sample was selected using a simple random sampling method of 40 respondents. The sample was divided into 2 groups, namely the treatment group providing education on heart disease prevention efforts as many as 20 patients and the control group as many as 20 respondents.

The description of the characteristics of the respondents in this study can be seen in table 2 below:

Table 2. Description of respondents' characteristics by age, gender, BMI, and smoking status

Variable	*Intervention*		*Control*	
	Frequency	%	Frequency	%
Age				
55-60	8	40	9	45
61-65	12	60	11	55
Amount	20	100	20	100
Gender				
Man	10	50	7	35
Woman	10	50	13	65

Amount	20	100	20	100
BMI				
Skinny: < 18.5	7	35	4	20
Normal: 18.5-25.0	13	65	16	80
Amount	20	100	20	100
Smoking Status				
Yes	2	10	2	10
Not	18	90	18	90
Amount	20	100	20	100

Table 2 shows that the majority of respondents aged 61-65 years in both the intervention and control groups were 12 people (60%) and 11 people (55%). Then the gender of the respondents in the intervention group was equal between men and women, namely 10 people each (50%), while in the control group the majority were women, namely 13 people (65%).

The majority of respondents in this study had normal BMI in both the intervention group and the control group, which were 8 people (40%) and 12 people (60%). Furthermore, in this study, the majority of respondents did not smoke in either the intervention group or the control group, which were 18 people (90%).

3.2 An Overview of the Prevention of Heart Disease Before and After the Intervention in the Intervention and Control Groups

The description of the prevention of heart disease before and after the intervention of the intervention and control groups is shown in table 3 below:

Table 3. Overview of heart disease prevention efforts in the intervention and control groups

	Respondent group	mean	Std. Deviation	n
Before intervention efforts to prevent heart disease	Intervention	14.70	1,780	20
	Control	10.70	1,577	20
	Total	15.20	2,244	40
After intervention efforts to prevent heart disease	Intervention	17.95	2,305	20
	Control	11.60	1.161	20
	Total	18.77	2,358	40

Table 3 shows that efforts to prevent heart disease before intervention in the intervention group mean 14.70 and 10.70 in the control group. While the mean value after intervention in the intervention group was 17.95 and 11.60 in the control group.

3.3 An Overview of Heart Disease Stratification Before and After Intervention in the Intervention and Control Groups

Table 4. Description of heart disease stratification in the intervention and control groups before and after the intervention

	Respondent group	mean	Std. Deviation	n
Prior to cardiac disease stratification	Intervention	7.20	2.16	20
	Control	6.85	2.83	20

intervention	Total	7.02	2.49	40
After cardiac disease stratification intervention	Intervention	4.20	2.00	20
	Control	6.90	2.37	20
	Total	9.15	2.60	40

Table 4 shows that the stratification of heart disease before intervention in the intervention group means 7.20 and 6.85 in the control group. While the mean value after intervention in the intervention group was 9.20 and 6.20 in the control group.

3.4 Differences in Heart Disease Prevention Efforts Before and After the Intervention

The difference in the prevention of heart disease before and after the intervention is shown in table 5 below:

Table 5. The difference in the prevention of heart disease before and after the intervention

Effort	***mean***		***Sig. (2-tailed)***
Heart disease prevention	Before	After	
Control	10.70	11.60	0.000
Intervention	14.70	17.95	0.000

Based on table 5 the results showed that the average value of heart disease prevention efforts in the control group before the intervention was is10.70, then after intervention the average value has increased to11.60. This shows that this result is also strengthened by the results of statistical tests which show the value of p = 0.000.

The results of the study in the treatment group showed that the average value of heart disease prevention efforts in the treatment group before being given education on heart disease prevention efforts is 14.70, then after being educated the average value has increased to17.95. It also shows thatthe results of statistical tests that show the value of p = 0.000. In the control and treatment groups, the p value = 0.000, which means the p value < (0.05) so it can be concluded that statisticallyEducation on heart disease efforts is effective in increasing efforts to prevent heart disease.

3.5 Differences in Heart Disease Stratification Before and After Intervention

Differences in heart disease stratification before and after intervention in table 6 below:

Table 6. Differences in heart disease stratification before and after intervention

Stratification heart disease	***mean***		***Sig. (2-tailed)***
	Before	After	
Control	6.20	6.90	0.000
Intervention	7.20	4.20	0.000

Based on table 6 The results showed that the average value of heart disease stratification in the control group before the intervention is6.20, then after intervention the average value has increased to6.90. This shows thatThis result is also strengthened by the results of statistical tests which show the value of p = 0.000.

The results of the study in the treatment group showed that the average value of heart disease stratification in the treatment group before being given education on prevention of

heart disease is7.20, then after being educated the average value has decreased to4.20. It also shows thatthe results of statistical tests that show the value of p = 0.000. In the control and treatment groups, the p value = 0.000, which means the p value < (0.05) so it can be concluded that statisticallyeducation on heart disease efforts is effective in reducing heart disease stratification from high risk stratification to medium risk stratification

3.6 Discussion

a. Characteristics of Respondents

The majority of respondents aged 61-65 years in both the intervention group and the control group were 12 people (60%) and 11 people (55%). Then the gender of the respondents in the intervention group was equal between men and women, namely 10 people each (50%), while in the control group the majority were women, namely 13 people (65%).

The majority of respondents in this study had normal BMI in both the intervention group and the control group, which were 8 people (40%) and 12 people (60%). Furthermore, in this study the majority of respondents did not smoke in both the intervention group and the control group, each of which was 18 people (90%).

According to Supriyono, (2008) age over 45 years (87.5%) is the dominant factor contributing to heart disease. This is also in accordance with WHO (2002) that age over 60 years shows a high mortality rate caused by heart disease. According to the CDC (Centers for Disease Control and Prevention), Prevalence of Coronary Heart Disease, United States, 2006-2010. In 2010, the greatest prevalence of heart disease occurred among people aged 65 years (19.8%), followed by people aged 45 - 64 years (7.1%) and those aged 18 - 44 years (1.2 %). The prevalence of CHD is greater in men (7.8%). According to Heart disease Risk Factors (2011) old age is a risk factor for heart disease. Even, about 4 out of every 5 deaths from heart disease occur in the elderly aged 65 years. Meanwhile, according to the CDC (2011) based on overall gender, men have a higher risk of heart attack than women. But the differences narrowed after women's menopause. After age 65, the risk of heart disease is about the same for each sex when other risk factors are similar.

b. Differences in Heart Disease Prevention Efforts Before and After Intervention

Based on table 4.4The results showed that the average value of heart disease prevention efforts in the control group before the intervention was is10.7000, then after intervention the average value has increased to 11.6000. This shows that This result is also strengthened by the results of statistical tests which show the value of p = 0.000.

The results of the study in the treatment group showed that the average value of heart disease prevention efforts in the treatment group before being given education on heart disease prevention efforts is 14,700, then after being educated the average value has increased to17.9500. It also shows thatthe results of statistical tests that show the value of p = 0.000. In the control and treatment groups, the p value = 0.000, which means the p value < (0.05) so it can be concluded that statistically Education on heart disease efforts is effective in increasing efforts to prevent heart disease.

This situation also illustrates that education is an activity that can affect changes in the knowledge and attitudes of respondents. These results are in accordance with the ultimate goal of education or learning, namely so that people can know, respond to and implement healthy living behaviors. Changes in behavior can be in the form of knowledge, attitudes or actions or a combination of these three components (Depkes RI, 2002).

c. Differences in Heart Disease Stratification Before and After Intervention

Based on table 6 The results showed that the average value of heart disease stratification in the control group before the intervention is6.2000, then after intervention the average value has increased to6900. This shows thatThis result is also strengthened by the results of statistical tests which show the value of p = 0.000.

The results of the study in the treatment group showed that the average value of heart disease stratification in the treatment group before being given education on prevention of heart disease is7.2000, then after being educated the average value has decreased to4.2000. It also shows thatthe results of statistical tests that show the value of p = 0.000. In the control and treatment groups, the p value = 0.000, which means the p value < (0.05) so it can be concluded that statisticallyeducation of heart disease efforts is effective in reducing heart disease stratification from high risk stratification to medium risk stratification.

According to McCoven and Black (2010), although there are variations or differences in the presence of these risk factors, hypertension, hypercholesterolemia, smoking, obesity, physical inactivity and diabetes are increasingly being found in adult populations anywhere in the world, but there is an improvement in knowledge and awareness. of heart disease problems as well as improvements in medical services, some risk factors appear to be decreasing. It is also in the research data that the average stratification changes from high risk to moderate risk, due to changes in smoking behavior, weight, activity and blood pressure of respondents.

In addition, according to Basuni (2011), this preventive management strategy must be right on target in order to prevent or even carry out the necessary examinations or interventions for those who are at high risk, carry out preventive measures and education for those who are currently at low risk, perform other additional checks to ensure level of risk for those with multiple risk factors and with medium risk so as to reduce the financing burden and the problems that will result.

IV. Conclusion

The conclusions that can be drawn from this research are:

1. An overview heart disease prevention efforts in the intervention group was an increase in prevention efforts towards both before and after the intervention.
2. An overview of heart disease stratification is a decrease in the risk of heart disease from high risk to low risk before and after the intervention.
3. There is an effect of providing education on the prevention of heart disease and the stratification of heart disease byp value = 0.000, which means p value < (0.05).

Suggestions

Based on the conclusions above, the suggestions are as follows:

1. Health Center

   To conduct structured education to the community with educational books that have been made and given to the community so that people can use the book as a guide.
2. Public Health Office

   To strengthen the health promotion program by conducting screening at POSBINDU to find out risk factors for disease so that treatment can be carried out as early as possible.
3. Educational institutions

   The education sector can prepare students to provide structured education with heart disease prevention guidebooks so that they can contribute to health problems.

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