

Available online on 15.12.2022 at <http://ajprd.com>

Asian Journal of Pharmaceutical Research and Development

Open Access to Pharmaceutical and Medical Research

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Research Article

Educational modules as an effort to increase knowledge of cardiovascular disease risk prevention

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ABSTRACT

Background: Heart disease is no longer affecting the elderly, but more and more young people are getting heart disease. An educational approach in health promotion by using attractive media is one of the most necessary ways to invite teenagers to behave in a healthy life. The purpose of this study was to determine the effect of the education module on knowledge of risk factors for cardiovascular disease prevention. The research method used a quasi-experimental design with a control group. The research sample is students at SMK Era Pembangunan 3, West Jakarta. Sampling was done by simple random sampling and a total sample of 68 people were selected. Data were analyzed using chi square test and multiple logistic regression. The results showed that the education module given to respondents could increase students' knowledge in preventing cardiovascular disease risk factors with a p value of 0.000:OR 51.83 (95% CI 9.84-273.05). Conclusion: the education module has an effect on increasing knowledge about the prevention of cardiovascular disease risk factors. Recommendations are expected that future research will develop more instruments on risk factors for cardiovascular disease.

Keywords: Educational module; prevention; cardiovascular disease

ARTICLE INFO: Received 10 Nov. 2022; Review Complete 05 Dec. 2022; Accepted 10 Dec. 2022; Available online 15 Dec. 2022



Cite this article as:

IiSolihah, Educational modules as an effort to increase knowledge of cardiovascular disease risk prevention, Asian Journal of Pharmaceutical Research and Development. 2022; 10(6):18-22.

DOI: <http://dx.doi.org/10.22270/ajprd.v10i6.1209>

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INTRODUCTION:

Patients with heart disease today are not only suffered by elderly people, but more and more young people are suffering from heart disease. Heart disease is a major health problem and a cause of death. Data from the World Health Organization (WHO) states that more than 17 million people worldwide die from heart and blood vessel disease. The incidence of heart and blood vessel disease is increasing from year to year. At least, 15 out of 1,000 people, or around 2,784,064 individuals in Indonesia suffer from heart disease. It is estimated that the highest number of coronary heart disease sufferers based on a doctor's diagnosis is in Province Jakarta, with 53,265 people (0.7%).¹⁻³

Physical activity has a significant relationship with the incidence of coronary heart disease in people over the age of 15 in Indonesia, the prevalence of hypertension in students is 107 respondents (35.7%). Poor physical activity is the most dominant risk factor for students, namely 164 respondents (54.7%). Obesity is a risk factor that has the highest chance (6 times) associated with cardiovascular disease (hypertension) in students. The risk factors associated with the incidence of hypertension in students are obesity ($p = 0.000$) and physical inactivity ($p = 0.002$).⁴

Adolescence is a period that determines the pattern of health status formation in adulthood. Adolescent physical health is not just about being active but includes eating well and taking steps to prevent or manage chronic disease.

Unhealthy lifestyle such as inadequate physical activity, poor eating habits, overweight and obesity, use of tobacco these problems can increase the risk of degenerative diseases in the future. The presence of these risk behaviors in adolescents shows the importance of an approach by way of education and participation. Promotion of prevention and control of risk factors for heart disease can be done through health promotion.⁵⁻⁷

Factors that influence disease prevention behavior carried out by a person are influenced by intrinsic and extrinsic factors, intrinsic factors, namely factors that come from within oneself including level of education, age, occupation, knowledge, experience and extrinsic factors, namely external factors, including: norms, counseling on the availability of affordable health services and the mass media. Education using modules is an effort to optimize the delivery of messages and students' interest in understanding risk factors for heart disease properly and effectively. Counseling is included in one form of education. Health education is needed to obtain information that supports health so that it can improve the quality of life. Health education is very important as a means to obtain information in the health sector so that it has a positive

RESULTS

Table 1: Respondent Characteristic Homogeneity Test

Respondent Characteristic	p-value
Weight	*0.370
Gender	*0.339
BMI	*0.704
Blood pressure	

Table 1. Shows that the variables of weight, gender, BMI and blood pressure in the intervention and control groups have the same or homogeneous data variance with a sig value > 0.05.

Table 2: Frequency Distribution of Respondent Characteristics

Characteristics	Intervention		Control	
	n	%	n	%
Gender				
Male	19	55.9	15	44.1
Female	15	44.1	19	55.9
BMI				
Normal	9	26.5	12	35.3
Light Skinny	1	2.9	2	5.9
Light Fat	5	14.7	6	17.6
Heavy Fat	19	55.9	14	41.2
Blood pressure1				
Normal	12	35.3	12	35.3
Hypotension	0	0	1	2.9
Pre-hypertension	17	50.0	15	44.1
HypertensionTk 1	4	11.8	4	11.8
HypertensionTk 2	1	2.9	2	5.9
BMI 2				
Normal	9	26.5	13	38.2
Light Skinny	0	0	1	2.9
Skinny Weight	1	2.9	1	2.9
Light Fat	8	23.5	7	20.6
Heavy Fat	16	47.1	12	35.3
Blood pressure2				
Normal	17	50.0	10	29.4
Hypotension	2	5.9	2	5.9
Pre-hypertension	14	41.2	16	47.1
HypertensionTk 1	1	2.9	3	8.8
HypertensionTk 2	0	0	3	8.8
Family Disease History				
Low	13	38.2	9	26.5
Medium	8	23.5	15	44.1
Height	13	38.2	10	29.4
Total	34	100	34	100

Table 2 shows that in the intervention group the majority were female (55.9%) but in the control group the majority

influence on a person's quality of life. Counseling can be done using the lecture method to be well received by the target.⁸Based on the above phenomena, the researchers are interested in conducting research entitled "The Influence of Educational Modules as an effort to increase knowledge of prevention of cardiovascular disease risk factors"

METHODS

The research design is a quasi-experimental study with pre and post-test designs with controls. The sample in this study was students of class X SMK Era Pembangunan 3 West Jakarta. Sampling was carried out by simple random sampling from a total sample of 230 people and 68 people were selected. Research activities are carried out at SMK Era Pembangunan West Jakarta, in 2021.

The data collection instrument used was a questionnaire containing the characteristics and knowledge of the respondents about preventing cardiovascular disease; measurement of height (TB) and weight (BB) as well as assessment of nutritional status (Z-Score, BMI) using WHO Anthroplus; blood pressure measurement. Data were analyzed using the chi square test and multiple logistic regression.

were male (55.9%). Based on the BMI results, both the intervention group and the control group were in the

category of severe obesity with respective percentages of 55.9% and 41.2%. In the first blood pressure measurement, most of the respondents in both the intervention group and the control group were in the pre-hypertensive category, but in the second blood pressure measurement, most of the hypertensive group already had normal blood pressure (50%) but in the control group it was the other way around.

still remained the same, namely the majority were still in the pre-hypertensive group (44.1%). Based on the variable family history of disease, in the intervention group the percentage of respondents who had a low and high family history of the disease were the same, namely 38.2%, but in contrast, most of the control group had a moderate family history of disease, namely 44.1%.

Table 3: Characteristics of respondents based on body weight, height, BMI and blood pressure

Variable	Intervention				Control			
	Mean	SD	95 % CI	Min-Max	Mean	SD	95 % CI	Min-Max
Body weight	68.44	12.63	64.03-72.85	42-94	72.15	20.31	65.06-79.23	48-120
Height	158	7.21	156-161	140-173	163	10.4	160.23-167.53	142-148
BMI 1	27.17	4.97	25.43-28.90	18.2-34.9	26.66	5.98	24.57-28.74	17.2-44
BMI 2	26.59	5.18	24.79-28.40	16.4-35.5	26.08	5.78	24.07-28.10	15.8-43.2
Blood pressure 1								
Systole	117.62	11.19	113.71- 121.52	100-140	119.26	14.89	114.07- 124.46	87-153
Diastole	81.44	7.99	78.65- 84.23	61-102	78.65	11.09	74.78- 82.52	55-104
Blood pressure 2								
Systole	112.47	7.98	109.69-115.26	95-136	121.56	16.16	115.92-127.20	90-158
Diastole	76.71	9.00	73.56-79.85	56-91	77.79	14.01	72.91-82.68	49-106

Table 3 shows that the average body weight of respondents in the intervention group was 68.44 kg, this value was lower than the control group which had an average body weight of 72.15 kg. In the intervention group, the average height of the respondents was 158 cm, while in the control group, the average height of the respondents was 163 cm. BMI in the intervention group was slightly higher compared to. control group. The first average BMI in the intervention group was 27.17 while in the control group it

was 26.66. In the second BMI measurement, in each group it decreased, namely in the intervention group it became 26.59 and the control group 26.08. The average blood pressure at measurement 1 in the intervention group and the control group was not much different. In the intervention group, the average systole was 117.62 mmHg, while in the control group, the average was 119.26 mmHg, while the diastole in the intervention group was 81.44 mmHg and in the control group, it was 78.65 mmHg.

Table 4: Characteristics of respondents based on knowledge

Knowledge	Intervention				Control			
	Mean	SD	95% CI	Min-Max	Mean	SD	95% CI	Min-Max
Smoking habit								
Pre-test	73.53	12.52	69.16-77.90	30-80	75.26	10.74	71.52-79.01	30-80
Post-test	93.41	8.51	90.44-96.38	80-100	75.79	8.18	72.94-78.65	45-80
Sports Habits								
Pre-test	64.12	23.76	55.83-72.41	13-80	65.09	22.23	57.33-72.85	13-80
Post-test	90.03	17.72	83.85-96.21	33-100	76.50	14.27	71.52-81.48	46-100
Eat vegetables and fruits								
Pre-test	75.00	12.22	70.74-79.26	46-80	76.06	13.06	71.50-80.62	30-80
Post-test	96.76	10.07	93.25-100.28	50-100	76.26	12.49	71.90-80.63	50-100
Consumption of sugar, salt and fat								
Pre-test	76.00	11.12	72.12-79.88	46-80	77.03	12.73	72.59-81.47	13-80
Post-test	91.79	13.56	87.06-96.53	66-100	77.91	12.97	73.39-82.44	60-100

Table 4 shows the average value of respondents' knowledge in preventing heart disease risk factors at the time before the intervention was given (pre-test) and the value at the time after the intervention was given (post-test). The results showed that the average knowledge of respondents in preventing heart disease risk factors

increased after being given intervention in the intervention group and in the control group the average value of knowledge experienced an increase in the post test. Nevertheless, in the table above it can be seen that the average difference in pre-test and post-test scores was higher in the intervention group than in the control group.

Table 5: Differences in Knowledge Between the Intervention and Control Groups

Knowledge	Intervention		Control		Total		p-value
	n	%	n	%	n	%	
Smoking habit							
Good	33	100	0	0	33	100	0.000
Less	1	2.9	34	97.1	35	100	
Sports Habits							
Good	25	75.8	8	24.2	33	100	0.000
Less	9	25.7	26	74.3	35	100	
Eat vegetables and fruits							
Good	30	88.2	4	11.8	34	100	0.000
Less	4	11.8	30	88.2	34	100	
Consumption of sugar, salt and fat							
Good	25	78.1	7	21.9	36	100	0.000
Less	9	25	27	75	32	100	

Table 5 shows that there are significant differences between cardiovascular disease risk factors between the intervention knowledge about smoking habits, knowledge of exercise group and the control group with a p value smaller than habits, knowledge of eating vegetables and fruit and 0.05. knowledge of sugar, salt and fat consumption in preventing

Table 6: Multivariate Analysis Candidate Selection

Variable	p-value
Education Module	0.000
Gender	0.026
BMI	0.237
Blood pressure	0.564
Family History	0.905

Table 6 shows that all variables were first categorized into bivariate selection using simple logistic regression. two groups using the median value cut off point. Variables that will be included in the next analysis are those Furthermore, multivariate analysis was performed using that have a p value greater than 0.25. multiple logistic regression. The initial step taken was

Table 7: The Final Model of the Effect of the ODOSE Model on Knowledge

Variable	B	SE	Wald	p-value*	Exp (B)	95%CI
Education Module	3.948	0.848	21.687	0.000	51.83	9.84-273.05
Gender	1.893	0.839	5.092	0.024	6.640	1.28-34.37
Constant	-3.181	0.855	13.839	0.000	0.042	

Table 7. The final model of multivariate analysis shows that the Education module given to respondents can increase students' knowledge in preventing cardiovascular disease risk factors 51.83 times higher than the control group besides that other factors that can increase respondents' knowledge in preventing cardiovascular disease risk factors are gender. Respondents who are female have knowledge of prevention of cardiovascular disease risk factors 6.64 times higher than male sex.

DISCUSSION

Education is the guidance that is given to someone for the development of other people towards certain dreams or ideals that determine humans to act and fill life in order to

achieve safety and happiness. Education is needed to obtain information in the form of things that support health so as to improve the quality of life. Education influences a person to participate in development and generally the higher the level of education a person has the easier it is to receive information. Knowledge related to heart disease prevention can be interpreted as the result of respondents' knowledge regarding all aspects of prevention knowledge which includes the causes of heart disease, signs, effects and ways of prevention, risk factors, and physical activity/exercise. Knowledge about risk factors for heart disease has an important role in determining intact behavior because knowledge will shape a person in determining his behavior. In this study, data on

respondents' knowledge about prevention of cardiovascular disease risk factors was analyzed, both in the intervention group and the control group (pre-test and post-test) using the chi square test and multiple logistic regression. BMI, and blood pressure in the intervention and control groups had the same or homogeneous data variance with a sig value > 0.05 .

The results showed that the average knowledge of respondents in preventing cardiovascular disease risk factors increased after being given intervention in the intervention group and in the control group the average value of knowledge experienced an increase in the post test. In the intervention group, the increase in knowledge was much greater than in the control group, which was not given the module. For the knowledge intervention group on preventing smoking habits, there was an average increase of 19.88 points, exercise habits 25.91 points, eating vegetables and fruit 21.76 points and consumption of sugar, salt and fat 15.79 points while for the control respectively an increase of: 0.89; 11.41am; .026 and 0.87 points. From the description above, it shows that learning modules are very helpful for increasing knowledge as the results of the study state that teaching materials in the form of modules can be used as a source of learning because they can make it easier for students to increase the enthusiasm of students to learn them. Another study, namely by providing multimedia education in the form of videos and modules can increase family knowledge, attitudes and behavior in early detection of risk factors for non-communicable diseases.^{9,10}

This study shows that the Education module given to respondents can increase students' knowledge in preventing cardiovascular disease risk factors 51.83 times higher than the control group. The higher one's knowledge, the higher the concern in maintaining health, conversely the less or low one's knowledge, one's They will also have less concern in maintaining their health. This study is also in line with research which states that there are differences in knowledge, before and after being given multimedia education with a p value of $0.001 < 0.05$. Another thing that can increase respondents' knowledge in preventing cardiovascular disease risk factors is gender, where respondents who are female have knowledge of prevention of cardiovascular disease risk factors 6.64 times higher than male gender, this study is the same as previous studies. Not only significantly different. biologically, but the roles and responsibilities of men and women are also different, which can influence the decisions that will be taken and faced, as well as efforts to improve health. The level of knowledge can be influenced by information factors received by respondents, if the information received is good, the better the respondent's knowledge in understanding heart disease prevention. Good knowledge is likely to be influenced by many factors, such as experience (self or others) and sources of information.¹¹⁻¹⁴

CONCLUSIONS

Based on the results of the study, it can be concluded that the educational module has an effect on increasing knowledge of prevention of cardiovascular disease risk factors.

ACKNOWLEDGMENTS

The authors thank to Health Polytechnic of Jakarta I for funding this research, all participants and research assistants.

ETHICAL CLEARANCE

This research has received ethical approval from the Research Ethics Committee, Health Polytechnic of Jakarta I No.166/KEPK/VIII/2021.

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