Since 2002

OPEN ACCESS

Self-efficacy of Doing Physical Exercise in People at Risk of Coronary Heart Disease

Rolly Harvie Stevan Rondonuwu (ID), Monica Tandiayuk, Dorce Sisfiani Sarimin (ID)

Department of Nursing, Polytechnic Ministry of Health Manado Indonesia, Manado, Indonesia

Abstract

BACKGROUND: Physical activity affects the body's mechanisms and increases high-density lipoprotein (HDL) levels, lowers low-density lipoprotein (LDL) levels in the body, increases glucose metabolism by increasing insulin sensitivity, and reduces excess fat levels and high blood pressure. Self-efficacy affects behavior changes, individuals and as a stimulus for activity.

AIM: The purpose of this study was to determine the effect of health education on self-efficacy of doing a physical exercise in the intervention group and the control group.

METHODS: This study was quantitative with a quasi-experimental control group pre- and post-test to compare the intervention in the control and intervention groups. Then, the difference between the pre-test and post-test was assumed to be the effect of the experiment. The control group received the leaflet intervention model and the intervention group received the guided education model and videos. Samples are people in the village Kopiwangker and Taraitak who met the inclusion criteria with the number 70.

RESULTS: The results showed a significant value score before and after intervention group with a value of 0.00 (paired t test) Thus, there is the effect of interventions using guided educational models and video media on self-efficacy of doing physical exercise, with p value of 0.0001. (t independent test).

CONCLUSION: There is a significant difference in self-efficacy between the control and intervention groups before and after being given education with different methods. This means that the guided education method/model using video media affects the self-efficacy of doing a physical exercise in people at risk of coronary heart disease.

Introduction

Coronary heart disease (CHD) is a major cause of premature death. Physical activity is a reference as the most important non-pharmacological primary and secondary prevention efforts for individuals with CHD to be physically active. Physical activity becomes a reference as the most important non-pharmacological primary and secondary prevention efforts for individuals with CHD to be physically active [1].

According to Winzer *et al*., 2018, in the Journal of Physical Activity in the Prevention and Treatment of Coronary Artery Disease, it is explained that regular physical activity is effective in the primary prevention of CHD, where physical activity includes an interest in leisure time which is associated with increased expenditure Energy [2].

Another study conducted by Sattelmair *et al*., 2011 which examined the dose response between physical activity and risk of CHD. A meta-analysis found that individuals who perform physical activity with an intensity of 150 min/week have a risk of CHD. % lower than those who do not do physical activity. Those who did at least 300 min of physical activity per week had a 20% lower risk. Individuals, who perform higher physical activity, have a much lower risk of CHD, compared to individuals who do not do physical activity [3].

The American College of Sports Medicine (ACSM) recommends getting at least 150 min of moderate-intensity aerobic exercise a week. Can divide it into 3–5 times a week with duration of 30–60 min/day?

Self-efficacy is a person's assessment of his personal ability to initiate and successfully perform the tasks set at the designated level in greater effort and persists in the face of adversity, which significantly affects the recovery process and the patient's quality of life [4].

The results of psychological assessments on people in Kopiwangker and Taraitak villages, Langowan sub-districts who are at risk for CHD on average, say they lack the desire to do exercises/activities. Some people say a lack of confidence in the face of physical disorders, as well as the lack of support exercise physical activity. The objective of this research is to determine the effect of health education on the self-efficacy of physical exercise in the control group and intervention.

Methods

This research is quantitative with a quasi-experimental control group pre- and post-test to compare the intervention in the control group and the intervention group, then the difference in the pre-test and post-test is assumed to be the effect of experiment [5].

Collecting data using a questionnaire to measure the self-efficacy of doing physical exercise. The questionnaire consists of 25 items. Test the validity and reliability of the instrument that the researchers conducted in the villages of Kopiwangker and Taraitak district Minahasa North Sulawesi Indonesia on 20 respondents. Test the validity of each item obtained with a value of r > 0.3. According to Nanuli said that if the value of r > 0.3, then the question item is said to be valid. In the reliability test using Cronbach alpha according to that the normal value is 0.8, while in this study, the Cronbach alpha value was 0.992 [6]. This means that the research instrument, both the questionnaire, meets the validity and reliability requirements for use.

Conducting sample selection according to the criteria for the control and intervention group, namely, in the villages of Kopiwangker and Taraitak, according to the inclusion criteria that have been made. Inclusion criteria: People who are at risk of CHD, age above 40 years, have a history of hypertension and have a smoking habit.

This activity was assisted by the Village Head as a field assistant with the team and research assistants. Next, make a list of potential respondents scattered in the village. Then, organize the sample and perform a random sampling technique to determine the control and intervention groups.

Researchers used the paired t-test. The data were processed using the IBM SPSS *Statistics* 21 program with a significance level of 95% ($\alpha = 0.05$).

This research has received research ethical clearance from the Ethics Commission of the Health Polytechnic, Ministry of Health of Manado, North Sulawesi, Indonesia, which uses research ethics standards according to the WHO and has been granted research permit recommendation from the government of Minahasa through the National Unity and Politics Agency.

Results

Characteristics of respondents are education and age. As a whole, they are farmers, so they are not included in the analysis.

Based on Table 1, it is known that the respondent's education is more senior high school 50 respondents or 71%, while the lowest is primary school

Table 1: Distribution of respondents based on education and age July–October 2021 (n = 70)

Characteristics of	Experimental Group (n = 35)		Control Group (n = 35)		Total	
	n	%	n	%	n	%
Education						
Primary School	3	8.5	3	9	6	9
Junior high School	8	23	6	17	14	20
Senior high School	24	68.5	26	74	50	71
Age						
40–45	7	20	10	29	17	24.3
46–50	26	74	22	63	48	68.6
>50	2	6	3	8	5	7.1

with 6 respondents or 9%. The age of the respondents is mostly in the range of 46-50 years with as many as 48 respondents or 68.6%, while the lowest is age >50 years as many as 5 respondents or 7.1%

The results of the normality test of the data in Table 2 show that the data are normally distributed.

Table 2: Normality test of self-efficacy (SE) variable data performing physical exercise July–October 2021 (n = 70)

Variable	Mean	SD	p < 0.05
Control Group			
SE score pre-test	31.03	4.127	0.200
SE score post-test	52.69	4.904	0.200
Experiment Group			
SE pre-test score	30.60	4.009	0.145
SE post-test score	84.29	5.701	0.200

*Kolmogorov–Smirnov test.

The data homogeneity test aims to determine the equality of data between the intervention group and the control group. This test is also used to prove that self-efficacy does not occur due to variations in respondents, but is the effect of the intervention carried out.

The results of the homogeneity test in Table 3 show that the respondents' self-efficacy before being given the intervention was homogeneous where p > 0.05. The assumption obtained from the results of this test is that the self-efficacy of performing initial physical activity in the experimental group is equivalent to the control group.

Table 3: Homogeneity test of self-efficacy doing physical exercise

Variable	p > 0.05
Pre-test intervention group	0.661*
Pre-test control group	

*One-way ANOVA test.

Table 4 shows a significant difference in the mean SE before and after the intervention with a p-value of 0.000. (paired t-test).

Table 4: Differences in mean self-efficacy before and after intervention in the control group July–October 2021 (n = 70)

Self-efficacy	N	Mean	p < 0.05
Pre-test	35	31.03	0.000*
Post-test	35	52.69	

*Paired t–test.

Table 5 shows a significant result of the mean self-efficacy before and after the experimental group intervention with a p-value of 0.000.

Table 5: Differences in Mean Self-efficacy before and after the Experimental Group Intervention of July–October 2021 (n = 70)

Self-efficacy	n	Mean	p < 0.05
Pre-test	35	30.60	0.000*
Post-test	35	84.29	

*Paired t-test.

Table 6 shows a significant results that there are differences in self-efficacy scores in the group given the lecture and leaflet model intervention (control group) with the lecture and video model experimental group with a p-value of 0.000. (t independent test)

Table 6: Differences in self-efficacy scores in the two groups who received lectures and leaflets (Control Group) with lecture and video models (Intervention Group)

Self-efficacy	n	Mean	p < 0.05
Control group	35	52.69	0.000*
Intervention group	35	84.29	

*t-independent test.

Discussion

The most important thing that must be owned by individuals to carry out health behavior is self-efficacy. An individual needs enough self-efficacy to carry out changes in his life, without self-efficacy, their motivation to change will be hampered. Patients who have high self-efficacy can affect the patient's confidence in implementing healthy living behaviors. Patients with low self-efficacy will be a barrier in their recovery [7].

Research that discusses the self-efficacy of CHD is a study conducted by Hendiarto and Hamidah at Haji Hospital of Surabaya. The results of the study entitled the relationship between self-efficacy and healthy behavior in coronary heart patients showed that the higher the self-efficacy in coronary heart patients, the higher the level of healthy behavior [8].

Research conducted by Wantiya entitled self-efficacy and health status in patients with CHD said about 60% of patients with CHD were hospitalized and about 40% experienced heart failure and died due to unhealthy lifestyle behaviors such as smoking/alcohol, poor diet, non-adherent to taking medication, lack of physical activity, and low self-efficacy [9].

Research conducted by Wantiyah, Saputra Mochamad Riko, Deviantony Fitrio with the title "self-efficacy and health status in coronary artery disease patients". The results of the study found a significant relationship between self-efficacy and health status. This relationship shows that good self-efficacy related to health management will have an impact on improving the health status of patients with CHD [9].

Supported by research by Ahn *et al.* which shows that there is a relationship between variables, where self-efficacy, healthy living behavior, and modifiable risk factors have an important role in improving the quality of life of patients with CHD [10].

Research conducted by Wahyuni *et al*. with the title "empowerment and self-efficacy of CHD patients through structured health education". The results of the study showed that the average empowerment and self-efficacy of CHD patients increased after being given education in the intervention group, while the control group did not show any improvement. The average empowerment and self-efficacy of CHD patients in the intervention group were higher than the control group. The results of the study can be concluded that structured health education is effective in increasing empowerment and self-efficacy of CHD patients [11].

The use of the video method for training is very effective in causing changes in individual knowledge and behavior. This is due to the efficiency of the video method in teaching skills. Video is an effective educational method. The results of research from Kobra 2016 say that the video method has a significant difference from the lecture method. Besides, this method also affects performance and improves the quality of life [12]

Health education media such as videos can be used as a tool in providing health education. The use of video in providing health education is considered appropriate to convey messages to the public. People prefer movement on videos, so they can provide examples of good behavior, prefer to imitate, or follow what they see [13].

Video media displays moving images, text, and sounds that explain the images displayed, thus attracting the target of health education. Video media displays the material in a concise, clear, and easy to understand manner, so that this can facilitate understanding and strengthen the respondent's memory [14].

According to Mubarak 2007, video media in the learning process can increase motivation because it can explain something complicated or complex through audiovisual stimuli which ultimately produce good results. Video media can be fun, not boring, and thus speeding up the process of delivering material [14].

Using audiovisual sources allow for more effective capture, as well as arouse curiosity about the topic, because people live in a culture where visual abilities and the ability to process information continue to be carried out. Video technology as an educational tool has enabled health workers to innovate knowledge, increase interest, and promote good learning [15].

These results have also represented the simplification function of reality owned by a learning media which is very helpful in introducing a reality that may be complex and complicated to be more easily understood by respondents so that they better understand the concepts being studied [16]. Many things can be obtained from the use of audio-visual as a medium, one of which is an increased understanding. However, this also needs to be balanced with the readiness of the facilitator in providing education that will apply to the media. The use of the right method can

also increase the effectiveness of the use of this audio-visual media. The differences that occurred in the two groups of course resulted from differences in learning in the experimental group that used audio-visual media which was not applied to the control class. This shows that there is a significant effect of using audio-visual media on the knowledge and skills of the experimental group so that it looks different from the understanding of concepts in the control group.

Based on statistical tests that showed significant results, there was a difference in self-efficacy scores in the group given the intervention of the lecture and leaflet model (control group) with the experimental group with the lecture and video model with p-value of 0.000. (t independent test. In addition, there are significant differences in behavioral scores in the group given the intervention of the lecture and leaflet model (control group) with the experimental group with the lecture and video model with p-value of 0.000. (t independent test). Hence, it can be concluded that there is a significant effect of health education on self-efficacy of doing physical exercise in people at risk for CHD in Langowan district before and after being given counseling which means that counseling greatly affects the self-efficacy of the community to do physical exercise.

Conclusion

This study that there is a significant difference in self-efficacy between the control and intervention groups before and after being given education with different methods. This means that the educational method/model greatly affects the self-efficacy of doing physical exercise in people at risk of CHD

Acknowledgments

References

1. Moholdt T, Lavie CJ, Nauman J. Sustained physical activity, not weight loss, associated with improved survival in coronary heart disease. J Am Coll Cardiol. 2018;71(10):1094-1101. https://doi.org/10.1016/j.jacc.2018.01.011
   PMid:29519349

2. Winzer EB, Woitek F, Linke A. Physical activity in the prevention and treatment of coronary artery disease. J Am Heart Assoc. 2018;7(4):e007725. https://doi.org/10.1161/JAHA.117.007725
   PMid:29437600

3. Sattelmair J, Pertman J, Ding EL, Kohl HW 3rd, Haskell W, Lee IM. Dose response between physical activity and risk of coronary heart disease: A Meta Analysis. Circulation. 2011;124(7):789-95. https://doi.org/10.1161/CIRCULATIONAHA.110.010710
   PMid:21810663

4. Peyman N, Shahedi F, Abdollahi M, Doosti H, Zadehadmad Z. Impact of self efficacy strategies education on self care behaviors among heart failure patients. J Tehran Heart Cent. 2020;15(1):6-11.
   PMid:32742286

5. Arikunto S. Research Procedures A Practical Approach. Jakarta: PT Rineka Cipta; 2006.

6. Dharma K. Nursing Research Methods. Jakarta: Trans InfoMedia; 2011.

7. Sarafino EP, Smith TW. Health Psychology: Biopsychosocial Interaction. New York, United States: John Wiley and Sons; 2011.

8. Hendiarto Y. The relationship between self-efficacy and healthy behavior in coronary heart patients. J Clin Psychol Mental Health. 2014;3(2):85-9.

9. Wantiyah W, Saputra MR, Deviantony F. Self-efficacy and health status in coronary artery disease patients. J Ners. 2020;15(1):14. https://doi.org/10.20473/jn.v15i1.17628

10. Ahn S, Song R, Choi SW. Effects of self-care health behaviors on quality of life mediated by cardiovascular risk factors among individuals with coronary artery disease: A structural equation modeling approach. Asian Nurs Res. 2016;10(2):158-63. https://doi.org/10.1016/j.anr.2016.03.004

11. Wahyuni A, Rezkiki F. Empowerment and Self-Efficacy of Coronary Heart Disease Patients through Structured Health Education. Indonesia: Stikes Fort De Kock Bukittinggi; 2014.

12. Kobra P, Sima L, Fariborz R, Rasouli AS, Neda K. The comparison of the effectiveness of two education methods video and lecture on knowledge, belief and practice of hand hygiene in nursing students: Clinical trial. Int J Med Res Health Sci. 2016;75:240-8.

13. Lystriani AD. Counseling with audiovisual media improves school age clean and healthy behavior. Prosiding The 5th University Research Colloquium 2017 : 112-7

14. Mubarak WI, Chayatin N, Rozikin K, Supriadi. Health Promotion an Introduction to the Learning Process in Education. Yogyakarta: Graha Ilmu; 2007.

15. Junior JC, Rebougas CB, Castro R. Development of an Educational Video for Promotion of Eye Health in Schools Children; 2017. p. 1-11.

16. Ningrum E. Classroom Action Research. Bandung: Buana Nusantara; 2009.