

ORIGINAL RESEARCH

EFFECT OF A WORKBOOK IN HEALTH EDUCATION ON SELF-EFFICACY AND QUALITY OF LIFE OF PATIENTS WITH CORONARY HEART DISEASE

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Abstract

Background: Coronary Heart Disease (CHD) has a high recurrence in Indonesia. This condition may occur as a result of the failure of compliance with post-acute management following a heart attack by CHD patients. One of the causes is the lack of effective health education.

Objective: The aim of this study was to identify the feasibility of the workbook in improving patients' self-efficacy (SE) and quality of life (QoL).

Methods: This research used a quasi-experimental with pretest-posttest control design. A pretest was done to the patients who were treated in the cardiac intensive unit, and a posttest was carried out at the end of the first and second month after the pretest. The population was all post-acute CHD patients who were admitted to the cardiac intensive unit in one of the referral hospitals in West Java, Indonesia. A purposive sampling was used and obtained 39 respondents who were divided into control and intervention groups. The intervention group was given a health education using a workbook, and the control group was given a direct health education. Self-efficacy was measured using a questionnaire developed by the authors, with high validity and reliability. A SF-12 instrument was used for measuring the quality of life. Data were analyzed using a descriptive quantitative analysis such as mean, Mann Whitney test, and Independent t-test. To estimate the effects of the intervention to QoL and SE, Kruskal Wallis test and One-way ANOVA were used.

Results: The results showed that there was an increase in SE and QoL in both groups, either in the posttest 1 or posttest 2. The comparison of QoL in the pretest, posttest I and II obtained $p=.452$, $.741$, and $.826$, while SE between and within groups obtained $p = .732$, $.220$, and $.009$, respectively.

Conclusions: Health education using the workbook was significantly more effective to increase SE than QoL of the CHD patients.

KEYWORDS

coronary heart disease; health education; self-efficacy; quality of life; workbook

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INTRODUCTION

Coronary Heart Disease (CHD) is a disease in which the prevalence increases every year and creates a high economic burden for Indonesia ([The Center of Data and Information, 2014](#)). This condition causes the importance of post-acute management of patients with CHD to prevent recurrence or unexpected complications. Efforts that must be made by patients after an acute attack include lifestyle changes, such as changes in dietary

patterns, smoking habits, limiting activities, controlling stress, and anxiety.

The rate of adherence to post-acute management in CHD patients in Indonesia is currently considered low. [Harun \(2013\)](#) stated in his research that controlling lifestyle in CHD patients is still a problem, especially in activity control and diet. In addition, the

poor management of the post-attack is still present, as indicated by the following indicators: 56% of patients often experienced angina, physical limitations were quite high at 42% in the study of 100 CHD patients after acute attacks ([Aan Nuraeni et al., 2016](#)), and CHD recurrence rated at 40% ([Indrawati, 2014](#)). Moreover, it is also known that the quality of life in more than half of patients with CHD in one of a referral hospital in West Java Indonesia was still low ([Aan Nuraeni et al., 2016](#)).

Several factors can be the causes of non-compliance for post-attack management in CHD patients. According to [Miller and DiMatteo \(2016\)](#), non-compliance with post-acute management can be influenced by lack of health literacy, poor health beliefs, and behaviors, side effects of treatment, financial limitations, and depression. Besides, according to [Shin et al. \(2013\)](#), another factor that had a significant direct effect on adherence to self-care in CHD patients is self-efficacy.

Self-efficacy affects the compliance of CHD patients in self-care, and one of the factors that influences self-efficacy is health information or knowledge ([Shin et al., 2013](#)). According to [Latimer et al. \(2005\)](#), health information is important for shaping health behavior and helps in determining actions in health management. [Indrawati \(2014\)](#) showed that there is a significant relationship between knowledge and the ability to do secondary prevention of CHD patients.

Current problems related to health education, especially in cardiac intensive units in one of the referral hospitals in West Java in Indonesia, are the provision of health education without the results of a comprehensive study of the learning needs of patients with general material. Moreover, nurses also stated that there was lack of time to provide health education to patients because of the high workload of nurses in the ICU and this was one of the obstacles to provide health education to the patients ([A. Nuraeni et al., 2017](#)). These results may lead to ineffective provision of information related to self-care after acute attacks on patients and families.

A workbook is a media prepared to be used as the source of information and is expected to be the answer to the problems related to the implementation of health education. One of the studies showed that CHD patients which had been given workbook had a greater increase in self-efficacy of physical activity ([Peterson et al., 2014](#)). However, this study analyzed the influence of workbook in the Black, Hispanic, and Caucasian participants in the United States which has different culture, demographic, and health management system with the Indonesian respondents, moreover, it only showed the relation in the use of workbook to the self-efficacy of physical activity.

The workbook in this study is prepared as a media of learning consisting of guidelines for managing CHD at home based on the learning need assessment, including the anatomy and physiology of cardiovascular and management of CHD symptoms, such as CHD patient activities in hospitals and at home, controlling risky lifestyles, fulfilling sexual needs, stress management, medications, and CPR. This workbook can be used by patients and families as a guideline to manage CHD patients at home, and also can be used by health workers such as nurses as learning

materials or media, a solution to the lack of time to provide overall education to patients and families. Furthermore, through this workbook, patients are also expected to play an active role in efforts to manage their self-care after an acute attack.

This study aimed to measure the feasibility of the workbook in improving the self-efficacy and the quality of life CHD patients after their acute attacks. Besides, this workbook is important for Indonesian people who have so many different backgrounds, such as cultural literacy, psychosocial conditions, and different health services for CHD patients in certain places. These differences can determine which methods can be given appropriately to certain situations and conditions of CHD patients.

METHODS

Study Design

This study used a quasi-experimental with a prospective approach using a pretest-posttest control design to investigate the feasibility of the workbook to enhance the self-efficacy and the quality of life.

Sample

The population was all post-acute CHD patients who were admitted to the cardiac intensive care unit in one of the referral hospitals in West Java. The sampling method used non-probability purposive sampling, with the inclusion criteria: Patients with CHD who were admitted in ICCU or HCCU, have not had any chest pain experiences at all in 24 hours, and stated by responsible nurses. The selected respondents were divided into the control group and intervention randomly.

The number of respondents was calculated using the formula of unpaired numerical analytic with type I errors set at 5%, and type II errors were set at 20%, and the average standard deviation of the previous study was 3.54 ([Delima et al., 2018](#)). Based on the calculation, the number of respondents was 23.74 rounded up to 24 respondents for each group, which indicated that a total of 48 respondents were recruited.

Instruments

The Self-Efficacy (SE) was measured using a questionnaire developed by researchers based on the theory of SE by [Bandura \(1997, 2004\)](#), which combined with the recovery management for post-acute CHD patients ([National Health Service, 2016](#); [National Heart Foundation of Australia, 2013](#)) and Cardio-pulmonary Resuscitation (CPR) guidelines from [American Heart Association \(2015\)](#). The SE questionnaire consists of 27 closed questions with rating scale - very confident, confident, not confident, and very not confident. The maximum score is 108, and the minimum is 27. A content validity of the instrument was tested by three experts in the cardiovascular and critical care nursing, followed by face validity in CHD patients. The construct validity test used a Pearson's product-moment in 60 respondents. The validity test showed items of SE instrument were valid with r ranged between .081 and .817 (r table = .081), except in the item no 27, but it was still included in the analysis. The reliability test results using Cronbach's alpha was .893. The quality of life (QoL)

was measured using the Indonesian version of the SF-12 instrument that had been used in previous Indonesian researcher, with minimum and maximum score were 12 and 47, respectively. The value of Pearson's r product moment in each question ranged between .53 and 0.83 (> 0.51) (r table) and Cronbach's α value .855 (Kiki, 2007).

Intervention

The workbook was developed by researchers based on national heart information (National Health Service, 2016; National Heart Foundation of Australia, 2013), guidelines for management of hyperlipidemia from the Association of Indonesian Cardiologists (Erwinanto et al., 2013), and CPR guidelines from American Heart Association (2015). Basis of the workbook content related to the Cardiac Patients' Learning Needs study (Aan Nuraeni et al., 2018). The workbook contains guidelines for managing CHD patients at home, such as information about anatomy and physiology of cardiac, pathophysiology of heart attack, symptoms management of CHD, lifestyle modification, medications use in CHD, diet, physical activity, psychological needs, and CPR. The workbook content had been peer-reviewed by two specialist cardiovascular physicians and three nurses who have experience in handling CHD patients of more than 15 years. In addition, the workbook is also provided with a record of the implementation of CHD management that must be filled in every day by the patient.

The study was conducted using the pretest-posttest method in the control and intervention groups for two months period and delivered by nurses. In the cardiac intensive care unit, both groups of selected respondents were given the SE and QoL instruments as a pre-test. Then, the intervention group was given a workbook and notified of its use. While the control group was given direct health education which was usually done by nurses or doctors. After the respondents of both groups discharged from the ward, the measurement of SE and QoL were performed by phone at the first and second month after their pretest were taken.

Data Collection

The data were collected from May to August 2018 by a research assistant who is also a nurse. The pretest was conducted to control and intervention groups in the cardiac intensive care unit when patients had been declared free from chest pain for 24 hours by doctors. The posttest had been done twice, in one month and two months after pretest, after the respondents of both groups

discharged from the ward. The measurement of SE and QoL in the posttest was performed by phone.

Data Analysis

The descriptive analysis used quantitative data analysis was applied to describe the SE and QoL from both groups at the three measurement stages with minimum, maximum, mean, standard deviation, frequency and percentage values. To estimate the effect of the intervention to respondents' SE was used the One-way ANOVA, because the study measured the comparison mean of two groups without category to analyze estimation effects of, while the Kruskal Wallis test was used to describe the intervention effects on respondents' QoL.

Ethical Consideration

Ethical clearance for data collection had been obtained from the Research Ethics Committee of Universitas Padjadjaran No. 575/UN6.KEP/EC/218. All respondents had been informed and signed the consent when they agreed to participate in this study. In order to protect the respondents from unexpected conditions, considering they were patients who were in the post-acute phase, then the provision of health education was only given to those who have been declared free of chest pain at least within 24 hours stated by nurses or doctors. In addition, in the workbook is also provided information about treatment that must be done by patients or families in the event of an emergency condition such as chest pain when they are carrying out certain activities.

RESULTS

Characteristics of Respondents

During the respondents' recruitment, the number of respondents in the initial data collection (pre-test) was 52 persons, and then 11 respondents dropped out (posttest one) because they could not be contacted and three respondents died. Phase two monitoring was done in two months after the pre-test. In this phase, two respondents died, so only 39 respondents could continue this study; the response rate was 81.25%.

The following are the results of the quantitative data analysis, including the initial data (pre-test), the first-month data, and second-month data after the intervention.

Table 1 Respondents' Characteristics

Respondents' characteristics	Control Group		Intervention Group	
	f (n=19)	%	f (n=18)	%
Age (years)				
26 – 55	7	36.8	8	44.4
56 – 65	12	63.2	10	55.5
Sex				
Male	14	74	16	89
Female	5	26	2	11
Level of education				
Primary school	8	42	11	61
Moderate school	7	37	3	17

Table 1 Respondents' Characteristics (Cont.)

Respondents' characteristics	Control Group		Intervention Group	
	f (n=19)	%	f (n=18)	%
Higher education	4	2	4	22
Medical interventions				
PCI and medications	11	58	9	50
Medications	8	42	9	50
Duration of illness				
≤ 6 months	9	47	13	72
> 6 months	10	53	5	28
Have ever received health education				
No	11	58	14	78
Yes	8	42	4	22
An effort to get information				
No	8	42.2	10	56
Through media information	2	10.5	4	22
Through other people	-	-	1	5.6
Through health workers	8	42	2	11.11
Others	1	5.3	1	5.6

Table 2 The Pretest and Posttest of Quality of Life and Self-Efficacy of the Control and Intervention Groups

Variables	Mean±SD		Median (min-max)		Variant <i>p</i>
	Control	Intervention	Control	Intervention	
Pretest					
Quality of life (SF 12)	36.9±6.9	38.6±5.5	41(21-44)	40.5(27-46)	.180
Self-efficacy	79.7±4.24	79.2±3.85	78(74-89)	79.5(73-87)	.481
Posttest I after one month					
Quality of life (SF 12)	43±2.9	42.7±3.6	43(34-46)	43(31-46)	
Self-efficacy	82±5.1	84.3±6.2	83(74-90)	82.5(75-97)	
Posttest after two months					
Quality of life (SF 12)	45.1±1.8	45.1±1.36	46(39-46)	46(43-46)	
Self-efficacy	92.1±6.9	97.6±4.9	91(80-105)	97.5(84-105)	

Homogeneity of Quality of Life and Self-Efficacy in the Control and Intervention Groups

Based on Table 2, it can be seen that the initial data on QoL and SE of respondents were all homogeneous, this can be seen from the variance $p > .05$.

Differences in QoL and SE in the Control and Intervention Group

Table 3 shows the different score between two groups. The Mann-Whitney was used to measures the different test for QoL between

two groups because the data were not normally distributed. While the SE used the Independent T-test because the data were normal. The results showed a positive increase in all variables in both groups. However, either the variable of QoL or SE was not significantly improved after one-month measurement ($p > .05$). It is also showed that the quality of life in the control group after two months of measurement had a similar increase in both groups. A significant difference was seen in self-efficacy. The intervention group had a higher increase in self-efficacy than the control group ($p = .009$).

Table 3 The Difference Posttest Result between the Control Group and the Intervention Group After One Month and Two Months

Variable	Mean±SD	Mean Rank		<i>p</i>
		Control	Intervention	
Quality of life (SF 12)				
After one month	42.8±3.2	19.55	18.42	.741
After two months	45.1±1.57	19.32	18.67	.826

Table 3 The Difference Posttest Result between the Control Group and the Intervention Group After One Month and Two Months (Cont.)

Self-efficacy (SE)	Mean±SD			
After one month	83.1±5.7	82.00±5.1	84.33±6.2	.223
After two months	94.78±6.6	92.1±6.9	97.6±4.9	.009

Comparison of Quality of life and Self-Efficacy in the Control and Intervention Groups in the Pretest, Posttest after One Month and after Two Months

Tables 4 and 5 show that after one and two months of measurement, the variable of QoL was not changed, which was in contrast with SE variable that after two months had a

significant change ($p = .009$) between control and intervention groups. There were no differences of SE between groups after one month. It indicates that neither direct health education nor workbook could improve the QoL of CHD patients. However, the workbook only increases the patient's SE after two months.

Table 4 The Comparison of Quality of Life in the Control and Intervention Groups in the Pretest, Posttest after One Month and After Two Months

Measurements	Mean Rank		p
	Control	Intervention	
Pre-test	17.71	20.36	.452
Post-test I (after one month)	19.55	18.42	.741
Post-test II (after two months)	19.32	18.67	.826

Table 5 The Comparison of Self-Efficacy in the control and intervention groups in the pre-test, post-test after one month and after two months (n = 36)

Measurements	Sum of Squares	df	Mean Square	F	p
Pretest					
Between groups	1.973	1	1.973	.120	.732
Within groups	577.216	35	16.492		
Posttest I (after one month)					
Between groups	50.324	1	50.324	1.561	.220
Within groups	1128.000	35	32.229		
Posttest II (after two months)					
Between groups	280.203	1	280.203	7.697	*.009
Within groups	1274.067	35	36.402		

DISCUSSION

Based on the results of the study, it can be seen that the quality of life and self-efficacy had good baseline scores. This condition indicated that even though the respondents were still in the acute phase, the respondents' quality of life scores are high (37.78), which means they had a good quality of life. Similarly, with self-efficacy, respondents believed they were able to manage CHD after a heart attack. These two variables showed mutually reinforcing results.

One month after the initial measurement, the score changed in both variables. Increased score occurred in quality of life and self-efficacy. Improvement in quality of life-based on this study occurred along with the improvement in the physical condition of the respondents. At the time of initial measurement, respondents were still in an acute condition, at that time a heart attack had just happened, the hemodynamic conditions of the respondents were relatively stable but under the influence of drugs, continuous monitoring, and bed rest. In this acute condition, CHD patients

usually experience a decrease in the physical condition and a high level of anxiety and also depressive symptoms. This condition increases especially before the intervention of revascularization and slightly decrease after going through PCI revascularization intervention, which was revealed by a previous study (Gu et al., 2016). Decreased physical conditions accompanied by psychological problems experienced by the patients can affect the low quality of life of patients (Aan Nuraeni et al., 2016). The same results were shown in this study, although the pretest quality of life was quite good at one month after the patients went through the acute phase, the quality of life score increased higher than the pretest. Likewise, with self-efficacy, an increase in scores occurred one month after the pre-est. According to Alavi et al. (2015), self-efficacy were influenced by experience, motivation, knowledge, and efficient educational system. Respondents had received health education either through direct education programs or through the workbook in accordance with their illness while undergoing treatment. In addition, when respondents underwent the recovery process, respondents also had experience

related to illness and management of the disease. These things are thought to be the cause of increasing self-efficacy.

Based on the results of different tests, a significant difference at two months after measurement occurred in self-efficacy. Self-efficacy in the intervention group increased higher than the control group. This occurs because of the influence of the education provided using the workbook. Self-efficacy is shaped by one's own experience, other people's experiences, verbal persuasion and one's psychological or affective state (Bandura, 1997). In addition, education, as well as an efficient education system can influence the improvement of self-efficacy (Alavi et al., 2015). Positive psychological conditions and educational efforts that have been made to respondents in this intervention group can strengthen the assumption that the differences in self-efficacy that occur between the control group and the intervention are due to additional interventions in the form of educational models using the workbook. The workbook contains information needed by respondents to manage the disease at home. In addition, respondents can re-read the material or the instructions they need. This is different from the usual health education provided so far, respondents were only given health education materials when they were treated without written information that could be taken home.

Improvement in quality of life in the control group and intervention did not show a significant difference when compared between the control group and the intervention group. But even so, the results of the pre-posttest comparison in each group showed that the intervention group experienced a higher increase compared to the pre-posttest of the control group. This shows that the addition of this education using a workbook can have a better effect in increasing the quality of life scores after two months after the acute attack experienced by respondents.

However, the increase in quality of life scores did not experience a significant difference when compared between the control group and the intervention group. The findings obtained based on the results of this analysis reinforce the reasons for the results that show no significant difference in quality of life between the control and intervention groups. According to Ahn et al. (2016), an improvement in quality of life will occur if an increase in self-efficacy is accompanied by improvement in self-care health behavior on modifiable cardiovascular risk factors. In this study, the respondents' self-care health behavior was only carried out in several aspects, allowing an increased score in quality of life did not differ significantly between the intervention and control groups.

Based on this research, it can be seen that the education provided through this workbook does not directly affect changes in quality of life but affects self-efficacy. According to Ahn et al. (2016), self-efficacy can affect the quality of life, there must be a change in self-care health behavior. The workbook provided is not fully able to change respondent's healthy behavior, so that barriers to self-care health behavior are still identified in CHD patients who have been educated through the workbook. Moreover, nurses can use the workbook to deliver health education to CHD patients

because this method significantly has proven to increase patients' self-efficacy in post-acute CHD management.

The limitation of this research was the small sample size. Therefore, it is necessary to do another study with more significant samples. Besides, it is also essential to analyze barriers in CHD patients' healthcare behavior.

CONCLUSIONS

In general, before health education was given, all respondents had a similar quality of life and self-efficacy. After one month, neither direct health education nor workbook could improve QoL and SE. However, after two months, only SE was improved by the workbook. Therefore, it could be concluded that workbook is more feasible to improve the SE than QoL in CHD patients after suffering an acute attack.

Declaration of Conflict of Interest

The authors declare that there is no conflict of interest.

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Author Contribution

All authors have contributed to the preparation of the manuscript. A.N. developed article ideas, theories, analyzed literature, interpreted data, and wrote manuscript. R.M. and A.A. interpreted data, wrote and criticized the manuscript. All authors agreed with the final approval of the manuscript.

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