Original Research

The Effect of Workbook on Illness Cognition in Coronary Heart Disease Patients

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ABSTRACT

Introduction: Recurrence of coronary heart disease (CHD) occurs due to non-compliance patients in managing CHD. One predictor of compliance with CHD management is illness cognition (IC), and IC can be improved through illness stimuli that can be done through health education in this study through workbooks. **Purpose:** This study aimed to identify the effect of the workbook on illness cognition in CHD patients. **Methods.** This research was a quasi-experimental with pretest-posttest control design. A pretest was done to the patient who was treated in the Cardiac Intensive Unit; 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 hospital in West Java, Indonesia. Purposive sampling was used and obtained 39 respondents who were divided into control and intervention groups. The instrument used was the illness cognition questionnaire (ICQ). Data were analyzed using the mean, median, percentage, and to estimate the effect of the workbook to the patients' IC used Wilcoxon and Friedman test. **Results:** The results showed an increase in acceptance and perceived benefits for both groups while in the helplessness showed the decrease scores. The p-value of IC comparison in the pre-test, post-test I, and II between groups for helplessness, acceptance, and perceived benefits were 0.118; 0.376; and 0.424, respectively. Besides, the p-value for differences of IC within control and intervention groups was less than 0.05. **Conclusions:** The workbook in this study generally did not provide significant IC changes to respondents.

Introduction

Patients with coronary heart disease (CHD) need to manage their disease continuously after experiencing an acute attack. This management is necessary to restore the patient's physical condition to a more optimal state and prevent a recurrence. However, recurrence rates in CHD patients in Indonesia are still high(Indrawati, 2014). Besides that, according to Harun (2013), the ability of CHD patients in controlling activity and diet is low. According to Indrawati (2012), one predictor of recurrence of a heart attack is due to the failure of patients in managing CHD.

Factors that influence adherence to CHD patients in conducting self-care are indirectly influenced by social support, and physical function. Both of these functions affect self-efficacy, reduce anxiety and depression (Shin, Hwang, Jeong, & Lee, 2013). Another influential factor is illness cognition (Reges et al., 2013). Illness cognition (IC) according to Reges et al., (2013), is the main predictor of exercise habits and cardiac rehabilitation. Kim and Kim (2019) added the influence of IC on CHD patients, that the more positive the cognitive-illness perceptions, the patient's disease management compliance will increase.

IC is a patient's perception of the illness situation they are feeling, accompanied by an emotional and cognitive assessment of the condition of illness and management that has been obtained (Leventhal, Diefenbach, & Leventhal, 1992). This condition will be represented by patients based on aspects of helplessness (maladaptive), acceptance (adaptive), and perceived benefits (adaptive) (Kraaimaat, HAN, Bijlsma, Jacobs, & Jongen, 2002). According to Kraaimaat et al. (2002), IC is a critical mediator between disease and patients' well-being, and IC is employed by patients to perceive illness situations into their physical and psychological health status.

According to Leventhal et al. (1992), IC is strongly influenced by illness stimuli, in this case, includes preliminary information that patients know about; information provided by external sources; and physical symptoms related to the disease. This information can be provided through health education. Shin et al (2013) added that counseling and education are essential examples of social support in improving self-efficacy and compliance in the management of the disease by CHD patients.

Health education delivered in the intensive care unit faces difficulties that result in the ineffectiveness of providing information to patients. Nurses stated that the high workload at the ICU caused problems in health education, including a lack of learning needs' assessment of the patients, a lack of time to do education, and a lack of learning media resources (Nuraeni, Mirwanti, & Anna, 2018). Related to these problems, the researchers developed a workbook as a learning medium for CHD patients and assisted nurses in implementing education in the Cardiac Intensive Care Unit. Workbook in this research consisting of guidelines for managing CHD at home based on the learning needs assessment. It is content, 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 guide to manage CHD patients at home, and also can be used by health workers such as nurses as learning materials or media, as a solution to the lack of time to provide overall education to patients and families.

A study related to the effectiveness of workbooks on management symptoms in CHD patients has been conducted by Peterson et al (2014). In his research, the workbook is proven to increase self-efficacy in physical activity, while how the effect of the workbook on IC is still unknown. This study aimed to measure the feasibility of the workbook in improving the IC in CHD patients after their acute attacks. Besides, this workbook is important for Indonesian people who have different backgrounds in cultural literacy, psychosocial conditions, and different health services. These differences determine which method can be given appropriately to

specific situations and conditions of CHD patients.

Method

Study design, and sample

This study was a quasi-experimental with a prospective approach using a pretest-posttest control design. 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. This study used the non-probability sampling with purposive sampling, with the inclusion criteria: Patients with CHD who were admitted in ICCU or HCCU and have not had any chest pain experiences at all in 24 hours, stated by responsible nurses. The selected respondents were divided randomly into the control and intervention group.

The number of respondents calculation 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, Sriati, & Nur'aeni, 2018). Based on the calculation, the number of respondents was 23.74 rounded up to 24 respondents for each group, so that a total of 48 respondents were recruited.

Instruments

IC data were collected using the Illness Cognition Questionnaire (ICQ) (Evers et al., 2001) that commonly used to measure IC in patients with chronic disease. ICQ validity test results ranged from 0.65 to 0.79 with an average of 0.73 and reliability using the Alfa Cronbach with the results of helplessness = 0.88; acceptance = 0.9; and perceived benefits = 0.85.

Intervention

The intervention in this study was education in CAD patients using a workbook. The study was conducted using the pretest-posttest method in the control and intervention groups for two months period. In the cardiac intensive care unit, both groups of selected respondents were given the IC Questionnaire as a pre-test. Then, the respondents in the intervention group were given a workbook. The content of workbook and how it is used was explained to them. 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 cardiac intensive care unit, the measurement of IC was performed by phone in the first (post-1) and second month (post-2) following the pre-test.

The workbook was developed by researchers based on the Cardiac Patients' Learning Needs study (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 which were developed based on some references. 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.

Data analysis

The data was analyzed used quantitative analysis. To describe IC in the pre-test, the first and second post-test used mean with standard deviation, and median with minimum and maximum score. While for respondent's characteristics used frequency and percentage. Besides, to estimate the effect of the workbook to the patients' IC used Wilcoxon and Friedman test.

Results

From 52 respondents who participated in the study reduced to 37 respondents who completed measurements up to post-test II, so the response rate in this study was 81.25%. In the following are the results of the quantitative data analysis, including the initial (pre-test), the post-test I, and the post-test II data.

Table 1. Respondent Characteristics

Respondent Characteristics	Control Group		Intervention Group	
	Frequency (n=19)	Percentage (%)	Frequency (n=18)	Percentage (%)
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
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 Pre-test: Illness Cognition in control and intervention groups

Illness Cognition	Mean±SD		Median (min-max)		Variance
	Control	Intervention	Control	Intervention	P
Helplessness	12.1±2.94	9.4±2.3	12(6-18)	9(6-15)	0.159
Acceptance	17.9±1.89	18.2±1.06	17(14-21)	18(17-21)	0.045
Perceived benefits	19.6±2.26	19.6±1.8	18(17-24)	19(17-23)	0.163

Table 2 explains the baseline values of respondents' illness cognition (IC) prior to the intervention in both groups and the data have an abnormal distribution. Based on the table it can be seen that the initial IC data on the respondents are all homogeneous except in the aspect of acceptance in both the control group and the intervention group this can be seen from the variance $p> 0.05$.

Table 3 Illness Cognition in the Post-test 1 (after one month) and the Post-test 2 (after two months) and the different test between control and intervention groups

Illness Cognition	Mean±SD		Median (min-maks)		p
	Control	Intervention	Control	Intervention	
Post-test 1					
Helplessness	9.3±2.5	7.9±1.8	9(6-17)	7(6-12)	0.04
Acceptance	19.4±1.4	18.9±1.3	19(17-21)	18(17-21)	0.276
Perceived benefits	20.8±2.1	20±1.7	21(18-24)	19.5(17-23)	0.447
Post-test 2					
Helplessness	7.8±2.7	6.6±1.3	7(6-17)	6(6-11)	0.118
Acceptance	21±1.6	21.7±1.0	21(17-23)	21(20-23)	0.367
Perceived benefits	21.8±1.7	23±0.97	23(18-24)	23(21-24)	0.461

Different test using Mann Whitney. Significance of p <0.05

Table 3 shows IC scores after one month and two months of measurement. In the post-one month measurement, the aspects of acceptance and perceived benefits did not differ significantly in the control group, and the intervention group. Different results are seen in the aspect of helplessness. In this aspect, the intervention group had a significant decrease in helplessness compared to the control group.

Measurements after two months showed positive IC results in the intervention group compared with scores in the control group. Helplessness decreased in the intervention group, whereas in the control group, it increased. Likewise, the acceptance and perception of benefits in the intervention group increased when compared to the control group even though the p-value was not significant (p> 0.05).

Table 4 Different tests in the control group with interventions in the pre, post-1 and post-2 using the Kruskal -Wallis test.

Illness Cognition	Mean-Rank (Pre-test)		p	Mean-Rank (Post-1)		p	Mean-Rank (Post-2)		P
	Control	Inter-vention		Control	Inter-vention		Control	Inter-vention	
Helplessness	24,11	14,11	0,002	23,58	16,24	0,04	22,58	17,29	0,118
Acceptance	17,68	22,45	0,172	21,85	18,05	0,27	18,45	21,63	0,367
Perceived benefits	18,85	21,21	0,50	21,33	18,61	0,45	18,68	21,39	0,424

Different test using Kruskal-Wallis test. Significance of p <0.05

Based on table 5, it can be seen that the difference between pre-test and post-test 1 is significant in the aspect of helplessness, whereas the other aspects show insignificant results at each measurement time.

Table 5 Different tests within the control and in the intervention group and Wilcoxon post-hoc analysis results.

Illness Cognition	Mean-Rank (Pre-test)	Mean-Rank (Post-1)	Mean-Rank (Post-2)	p	Post-hoc	
					Pre-test and post-test1 (p)	Post-1 and post-2 (p)
Control Group						
Helplessness	3.18	2.05	1.24	0.00	0.001	0.001
Acceptance	4.26	5.53	6.95	0.00	0.003	0.002
Perceived benefits	6.26	7.29	8.24	0.00	0.016	0.007
Intervention Group						
Helplessness	2.78	2.00	1.22	0.00	0.002	0.002
Acceptance	4.72	5.08	7.94	0.00	0.107	0.000
Perceived benefits	6.22	6.58	8.44	0.00	0.440	0.001

Different test using Friedman Test. Significance $p < 0.05$
Wilcoxon Post-hoc Test. Significance $p < 0.05$

Based on table 5, it can be seen that there are significant IC differences in each group in all aspects of IC, at three different measurements. Besides, the table also shows the results of the post hoc test in each group, namely the control and intervention groups. Differences seen include differences in pre-test with post-test1, post-test 1 with post-test 2.

In the control group significant differences in IC were seen at each measurement period, whereas in the intervention group the difference in scores in pre-test with post-test 1 was significant in the aspect of helplessness, while the difference in IC scores for post-test 1 and 2 differed significantly in all aspects of IC (helplessness, acceptance and perceived benefits).

Discussion

Based on the results of the study, it could be seen that the IC on the respondents had a good base score. Helplessness in both groups showed a low score (maximum score is 24), as well as acceptance and perceived benefits, respondents' scores close to a maximum number. One and two months after the initial data collection, there was a change in scores on all aspects of IC. Increased scores occurred in the IC for aspects of acceptance and perceived benefits, while the score reduction occurred in the aspect of helplessness. This indicates that respondents felt their helplessness was reduced one month after a heart attack. This increase in IC occurred along with the improvement of the physical condition after experiencing an acute phase. According to Gu, Zhou, Zhang, dan Cui (2016), in acute conditions, CHD patients usually experience a decrease in physical conditions and high levels of anxiety and also symptoms of depression that increase, particularly before the intervention.

Different test results for each aspect one month after the first measurement (pre-test) generally did not show any significant difference in the control and intervention groups for these aspects, except for the helplessness. In the helplessness aspect, the intervention group had a lower score than the control group with a significant difference. The different aspects of helplessness in the control and intervention groups occurred because of the additional interventions carried out. Education conducted using workbooks in the intervention group allows respondents in the group to bring information home and make it a reference for post-acute management while the respondents in the control group had the risk of forgetting because they only received health education in the hospital when the condition was still acute. This happened because health education in this phase is challenging. In the acute phase, the concentration and ability to digest information in patients is deficient. This condition is different from the intervention group, aside from being treated at the ICU, education can still be carried out through workbooks that can be brought home, thus anticipating forgetting patients, and allowing patients to learn the information written in the workbook by themselves.

An increase in acceptance scores and perceived benefits accompanied by a decrease in helplessness scores can produce adaptive coping in patients and improve the patient's condition (Leventhal, Diefenbach, & Elaine, 1992; van Mierlo, van Heugten, Post, de Kort, & Visser-Meily, 2015). Through cognition, the patient re-evaluates his experience in controlling his illness, and this will affect the coping that the patient will choose. Providing education using this workbook, can be useful for patients in re-evaluating their disease and giving direction on how to control their disease so that this appears to affect decreasing the score of higher helplessness in the intervention group.

After two months from the initial measurement, there was an increase in scores on the three aspects of IC both in the control and intervention groups, when compared to the score in the previous month, except for the helpless aspect but the decrease in the score of helplessness was positive, meaning that there was a decrease in the helplessness of the respondents. The positive meaning obtained from the results of this study can occur along with the improvement in physical condition of the respondents. Two months after an acute attack, the health conditions in CHD patients will gradually be optimal. This improvement in physical condition will encourage the patient to re-evaluate (re-cognition), and this will have an impact on improving the psychological condition of the patient. This is represented through an increase in acceptance scores and perceived benefits also accompanied by a decrease in helplessness (Van Mierlo et al., 2015). This positive or adaptive IC will be associated with positive outcomes (Evers et al., 2001) and this will also affect the quality of life of patients (Darlington et al., 2007; Stafford, Berk, & Jackson, 2009).

Increasing scores on the aspect of acceptance and perceived benefits and decreasing scores on the aspect of helplessness in the second month after the pre-test did not show a significant

difference between the control group and the intervention group. This happened because of the improvement in the physical condition experienced by the patient after two months of the acute phase of CHD. Improvement of physical function can be seen from the low score of helplessness in respondents in both groups. The improved physical condition causes positive re-cognition of the respondents and causes a strengthening of psychological aspects that encourage acceptance and better perception of benefits to respondents both in the control and intervention groups. Several factors, according to Shin et al. (2013), affect the perception of emotions and cognition of a CHD patient. According to Shin et al. (2013), knowledge, physical function, and social support influence the psychological condition of patients and determine compliance behavior. The Improved physical function supported by social support and excellent knowledge can improve positive emotional-cognitive patients. Shin further revealed that good functional status was significantly correlated with decreased anxiety and depression in CAD patients.

Conclusions

The workbook in this study generally did not provide significant IC changes to respondents, however there was a high decrease in helplessness in the intervention group one month after the acute phase, whereas in the second month the decrease in helplessness did not look different in the two groups of respondents as well as acceptance and perceived benefits. This study also showed a positive IC change in all respondents. These positive changes can occur along with the increase in the respondent's physical capacity after an acute phase. Improvement of physical condition can also indirectly affect the positive-emotional cognitive of patients.

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