Effect of Nurse-led Program in Coronary Heart Diseases Patients: A Systematic Review

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Abstract

BACKGROUND: Coronary heart disease (CHD) is one of the leading causes of death worldwide. Proper management for CHD patients is needed to reduce mortality. Nurses have a very important role in making CHD patients carry out optimal health behaviors.

AIM: This review study aims to identify the effect of nurse-led program on CHD patients.

METHODS: This systematic review was based on four electronic databases (Scopus, Science Direct, ProQuest, SAGE Journals) and published between 2011 and 2020. This review used the Joanna Briggs Institute and Prisma guidelines. The study’s eligibility was assessed from the title, abstract, research methodology, and full text. The review results were presented in tabulated data and narrative form.

RESULTS: Nine articles showed that the nurse-led program significantly improved health behavior, health-related quality of life, clinical outcome, and illness perception in CHD patients.

CONCLUSIONS: It is expected that the improvement of management in CHD patients will improve patients’ quality of life. Hence, it could reduce the number of morbidities and mortality.

Introduction

Acute Coronary Syndrome (ACS) is part of the coronary heart disease (a cardiovascular problem), one of the causes of mortality worldwide. The recent coronary heart disease mortality rate increased from 2006 to 2016 by 19.0%, namely 7.96 million to 9.48 million [1]. Furthermore, management of medication and proper care is needed for someone suffering from coronary heart disease to minimize the risk of death. The management of patients with coronary heart disease has two main

Objectives

Reducing symptoms and preventing recurrence and mortality [2]. Clinical management can be carried out by providing medication, lifestyle modification, and weight management [3].

Self-care behavior in patients with coronary heart disease can help reduce the appearance of signs and symptoms of the disease, which can improve the patient’s health status. Otherwise, inadequate self-care will result in poor patient health, increasing patient recurrence [4], [5]. Meanwhile, adequate self-care can increase satisfaction, fulfill daily needs, manage stress, and reduce complications [6].

Nurses are health service providers who have a very important role in managing patients with coronary heart disease. Nursing interventions can promote cardiovascular health by properly conducting counseling and self-management [7]. Patients with ACS are expected to have self-management skills in preventing recurrences that can lead to emergencies. However, the involvement of nurses is still not optimal in helping patients with ACS.

Nurse-led programs are a form of nursing intervention given to patients with coronary heart disease or ACS. Nurse-led programs can improve patient health outcomes [8]. This review, subsequently, aims to identify the effect of a non-led program in patients with coronary heart disease.
Methods

Study protocol

The study protocol used the Joanna Briggs Institute Guideline as a guide for assessing the quality of the study and used the PRISMA checklist to determine which articles fit for the purpose.

Searching strategy

The selected articles in this systematic review were obtained by searching electronic databases, including Scopus, Science Direct, ProQuest, SAGE Journals. The keywords used to select eligible articles in this review that followed Medical Subject Heading included (“Coronary Heart Diseases (CHD)” OR “Coronary Artery Diseases” OR “ACS” OR “Acute Myocardial Infarction”) AND (“Health Behavior” OR “Lifestyle”) AND (“Health Status”) AND (“Nurse-led Program”).

Inclusion criteria

The stages in selecting articles started by reading the appropriate article. Furthermore, the abstract was read mainly on our research design, the sample selected, and the analyzed data. After that, the researchers opened the full text of the article by checking the suitability of the predetermined inclusion criteria. The inclusion criteria used Population, Intervention, Comparability, Outcome, Study Design framework. The population included patients who have been diagnosed with coronary heart disease/coronary artery diseases/ACS/acute myocardial infarction, intervention Community base or prehospital received treatment in the form of nurse-led program. There were a comparison group (control) and an intervention outcome. Other eligibility criteria were full-text access, published in 2011-2020 and English. The Joanna Briggs Institute critical appraisal tool was also used as a checklist for Randomized Controlled Trials review.

The results of the selection of articles obtained 9 articles that met the inclusion criteria. The article selection was illustrated in the flow diagram based on PRISMA 2009 below, as showed in Figure 1.

Results

Characteristic of study

The results of the review obtained a study of nine articles that met the inclusion criteria. All studies used a randomized controlled trial design. Participants were the patients who had been diagnosed with CHD (n = 1), coronary artery diseases (n = 4), ACS (n = 4), and acute myocardial infarction (n = 1). All participants in the treatment group received intervention in the form of a nurse-led program, in which eight studies were conducted independently by nurses, and one study was conducted in collaboration with other health workers. Meanwhile, the entire control group received follow-ups or usual care routines.

Outcomes of study

As a result of the intervention, the study’s outcome found that the nurse-led program had a significant effect in improving health behavior, health-related quality of life (HRQoL), cognitive and psychological factors, and clinical outcomes. The literature search results are listed in Table 1.

1. Nurse-led programs improve health behavior.

Five studies (1,3,4,5,6) showed that nurse-led program intervention was able to improve health behavior in patients. Self-management, which is part of nurse-lead to Improved health behavior, could be in the form of exercise frequency and time, healthy diet, stress management, smoking cessation, adherence management, emergency management, emergency visits, outpatient visits, medication adherence, and alcohol consumption.

2. Nurse-led programs improve HRQoL.

Four studies (2,3,4,8) described the effectiveness of nurse-led programs in increasing HRQoL in patients with CHD. The increase in HRQoL is in the form of increased physical health status (physical function and bodily pain) and mental (emotional role function, mental health, vitality, and role limitations-emotional). A reduction in depressive symptoms and an improvement in the social subscale were also observed in one study.

3. Nurse-led programs improve cognitive and psychological factors.
<table>
<thead>
<tr>
<th>No.</th>
<th>Authors and years</th>
<th>n</th>
<th>Follow-up</th>
<th>Intervention group</th>
<th>Control group</th>
<th>Analysis</th>
<th>Outcome</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>[9]</td>
<td>62 patients with coronary artery disease</td>
<td>24th, 8th, 12th weeks</td>
<td>Nurse-led program based on Pender’s Health Promotion</td>
<td>Routine follow-ups</td>
<td>Mann Whitney HB</td>
<td>The frequency of exercise increased from 3 days a week to 6 days a week, and the exercise time increased from 50 min to 130 min.</td>
<td>Nurse-led programs improve exercise behavior in patients with coronary artery disease.</td>
</tr>
<tr>
<td>2</td>
<td>[10]</td>
<td>199 patients with coronary artery disease</td>
<td>7 months</td>
<td>Nurse-led transitional care program</td>
<td>Routine care and follow-up contacts</td>
<td>Independent t-test, paired t-test IP</td>
<td>The intervention group showed better results: higher knowledge scores (p = 0.003), physical health status (p = 0.014), mental health status (p = 0.044) and clinical outcomes in the form of blood pressure (p = 0.005), fasting blood glucose (p = 0.027), total cholesterol (p = 0.000), triglyceride (p = 0.002), low density lipoprotein cholesterol (p = 0.018) and body mass index (p = 0.002).</td>
<td>Nurse-led transitional care programs increased knowledge about coronary artery diseases, physical and mental health status, and clinical outcomes.</td>
</tr>
<tr>
<td>3</td>
<td>[11]</td>
<td>144 patients with coronary heart disease</td>
<td>6 months</td>
<td>The nurse-led multidisciplinary self-management program</td>
<td>Routine care</td>
<td>Repeated measures ANOVA, Chi-squared test HB, Psychological IP HRQOL</td>
<td>Emotional management (p = 0.000) and Disease Medical Management (DMM) (p = 0.046) showed better results in the intervention group namely DMM improvement in the form of compliance management (p = 0.016) and emergency management (p = 0.038). Self-efficacy showed better confidence in controlling symptom; P = 0.045 and confidence in maintaining function; P = 0.025. Health-related quality of life (physical, P = 0.006; mental, P = 0.000). Emergency visit (p = 0.025) and outpatient visits (p = 0.038) was found to be better in the intervention group. The intervention group was found to be better at changing health behavior (p = 0.029), mental health (p = 0.020) and declined fasting blood glucose (p = 0.016). Lifestyle-related risk factors in the intervention group obtained better results (≥1 LRFs, P = 0.002; ≥2 LRFs, P = 0.001; weight reduction, P = &lt;0.001; systolic blood pressure&lt;140 mmHg, P = 0.04)</td>
<td>Nurse-led multidisciplinary self-management improved behavior management, self-efficacy, health-related quality of life and can lower unplanned health service utilization.</td>
</tr>
<tr>
<td>4</td>
<td>[12]</td>
<td>64 patients with acute myocardial infarction</td>
<td>6 months</td>
<td>Nurse-led theory-based education program</td>
<td>Routine management</td>
<td>Repeated measure ANOVA HB, HRQOL CO</td>
<td>Healthy lifestyle experiences improved in the intervention group, including diet (p = 0.005), medication adherence (p = &lt;0.001), stress (p = &lt;0.001), smoking status (p = 0.017) and alcohol consumption (p = 0.005).</td>
<td>A nurse-led theory-based education program was able to improve and maintain blood glucose levels, health behavior and mental health of patients with acute myocardial infarction.</td>
</tr>
<tr>
<td>5</td>
<td>[13]</td>
<td>824 patients with coronary artery disease</td>
<td>12 months</td>
<td>Community-based lifestyle programs by nurses</td>
<td>Regular hospital-based</td>
<td>Chi-square test HB, CO</td>
<td>The intervention group showed significant increase in the intervention group compared to the control group (p = 0.03) which consisted of emotional subscale (p = 0.07), physical subscale (p = 0.03), and social subscale (p = 0.06). Depression also decreased significantly compared to the control group (p = &lt;0.001). Meanwhile, illness perception also increased more (p = 0.03) and had a better perception in a low-fat diet (p = 0.02) and regular exercise (p = 0.003).</td>
<td>Community-based lifestyle programs by nurses improved (fx) lifestyle-related risk factors.</td>
</tr>
<tr>
<td>6</td>
<td>[14]</td>
<td>224 patients with coronary artery disease</td>
<td>1 month</td>
<td>Nurse-led intervention</td>
<td>Usual care</td>
<td>Chi-square test Fishers exact test t-test Mann Whitney HB</td>
<td>Healthy lifestyle experiences improved in the intervention group, including diet (p = 0.005), medication adherence (p = &lt;0.001), stress (p = &lt;0.001), smoking status (p = 0.017) and alcohol consumption (p = 0.005).</td>
<td>The nurse-led intervention was effective in improving a healthy lifestyle in patients with coronary artery diseases.</td>
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<td>7</td>
<td>[15]</td>
<td>106 patients with acute coronary syndrome</td>
<td>3 months</td>
<td>30-min nurse-led computerized and standard care</td>
<td>Standard care</td>
<td>Mann Whitney IP</td>
<td>In the intervention group, risk perceptions were better (p = &lt;0.001). Meanwhile, illness perception also increased more (p = 0.03) and had a better perception in a low-fat diet (p = 0.02) and regular exercise (p = 0.003).</td>
<td>30-min nurse-led computerized can improve ACS patients’ understanding of CVD risk information and the importance of making lifestyle changes and improving perceptions of control in the short term.</td>
</tr>
<tr>
<td>8</td>
<td>[16]</td>
<td>754 patients with acute coronary syndrome</td>
<td>12 months</td>
<td>Nurse-coordinated prevention programme</td>
<td>Usual care</td>
<td>Mann Whitney U-tests, z2 tests or Fisher’s exact tests, ANOVA with repeated measure HRQOL</td>
<td>HRQoL the intervention group experienced a significant increase compared to the control group (p = 0.03) which consisted of emotional subscale (p = 0.07), physical subscale (p = 0.03), and social subscale (p = 0.06). Depression also decreased significantly compared to the control group (p = &lt;0.001). Meanwhile, illness perception also increased more (p = 0.03) and had a better perception in a low-fat diet (p = 0.02) and regular exercise (p = 0.003).</td>
<td>A nurse-coordinated prevention program was very effective in increasing HRQoL and reducing depressive symptoms in acute coronary syndrome patients.</td>
</tr>
<tr>
<td>9</td>
<td>[17]</td>
<td>768 patients with acute coronary syndrome</td>
<td>1st, 12th months</td>
<td>Nurse-led telephone-based secondary prevention</td>
<td>Usual care</td>
<td>Two-way ANOVA CO</td>
<td>LDL-C There was a significant improvement in the intervention group compared to the control group (p = &lt;0.001), and improvement was also found in diastolic blood pressure (p = 0.007).</td>
<td>Nurse-led telephone-based secondary prevention improved LDL-C and diastolic blood pressure in patients with the acute coronary syndrome.</td>
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</table>

**Table 1: The result of systematic review**

**ANCOVA**: Analysis of variance, **HRQOL**: Health-related quality of life
Nurse-led programs effectively increase knowledge and self-efficacy in controlling symptoms and maintaining function, risk, and illness perception.


Clinical outcomes are one of the effects obtained from nurse-led program interventions in four studies (2,4,5,9). Nurse-led programs improve blood pressure, fasting blood glucose, total cholesterol, triglycerides, low-density lipoprotein cholesterol, body mass index, and weight reduction.

Discussion

Coronary heart disease is a disease that needs to be followed up immediately. Proper management is needed to minimize complications. As one of the health service providers, the nurse must provide professional nursing care to optimize the patient’s health status. A nurse-led program is a service program that nurses can carry out to maximize the nursing care provided. This program is an intervention carried out by nurses to manage the patient’s illness [18]. Some of the advantages of providing this program are reducing the burden of treatment, improving integrated chronic disease management [19], [20] and improving self-care skills [21]. Disease recurrence can also be reduced through this program [19].

In this systematic review, our purpose was to identify the effect of a nurse-led program intervention in patients with coronary heart disease. The results of nine studies found that the nurse-led program effectively improved health behavior, HrQoL, cognitive and psychological factors, and clinical outcomes. Healthy living behavior and adherence to self-care could be improved by conducting nurse-led program intervention. The results of this review are in line with other studies in which the nurse-led program can improve health behavior in the form of medication adherence to patients suffering from chronic heart failure [22] and health-promoting behavior in patients with metabolic syndrome [23]. Diet regulating behavior and increased exercise were also found to be better [24]. However, it contradicts the results of other studies where the nurse-led program did not result in lifestyle improvements since everyone has a different lifestyle and has inaccurate beliefs [25].

HrQoL, both physical and mental health status, has increased due to nurse-led programs. The results of the review are in line with other studies where the physical aspects had significantly improved, resulting in a decrease in patients undergoing hospitalization or visits to emergency services [20], the occurrence of psychosocial improvement [24], and improving depression symptoms in older adults and early-stage cancer patients [26], [27]. Skill practice obtained in nurse-led intervention can help manage anxiety and fear [28]. However, other studies showed a different matter, where the nurse-led program did not cause a decrease in anxiety and depression in people with coronary heart disease so that it did not improve the mental health status of the sufferer [29]. The absence of improvement in mental health is also supported by other studies conducted on post-percutaneous coronary intervention patients [30].

Cognitive and psychological factors in the form of increased knowledge, self-efficacy in controlling symptoms and maintaining the function, and risk and illness perception experienced improvement due to nurse-led intervention. This review is in line with other studies that showed the effectiveness of nurse-led programs in increasing self-efficacy [23], improving risk perception [25], and effectively increasing knowledge and early detection beliefs in cancer patients [31].

Changes in clinical outcomes due to the provision of nurse-led programs are shown from the results of this review. These results align with other studies that a decrease in blood pressure and cholesterol occurred due to nurse-led program interventions; thus, it reduced the risk of cardiovascular disease [32], [33] and improved healthy habits [34]. These improvements in clinical outcomes may reduce patient recurrence to reduce visits to emergency services and hospitalizations.

Conclusion

Based on this study’s result, it can be concluded that nurse-led programs were part of nursing interventions that were very effective for patients with coronary heart disease. The effectiveness of this intervention was based on the results of a review that the nurse-led program could improve health behavior, HrQoL, cognitive and psychological factors and improve clinical outcomes in patients. The practical implication of this result is that nurses can use this program to maximize and optimize nursing care for patients with coronary heart disease.

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