JENDELA NURSING JOURNAL
Volume 8, Number 2, December 2024, 110-125

Nurses-led Intervention of Secondary Prevention in Patients with Acute Coronary Syndrome (ACS): A Scoping Review

Azalia Melati Putri[1], Yanny Trisyani[1], Noviani Megatami[1], Nuraulia Aghnia Armansyah[1], Nia Ratnasari[1], Fitriani Rahayu[1], Ilham Taufik Nurilhami[1], Neng Zihan Nurul Azizah[1], Dwi Murti Nurinsani[1], Tsabitah Rahmah[1], Elysia Widyadhari[1]

[1]Faculty of Nursing, Universitas Padjadjaran, West Java, Indonesia
Corresponding author: azalia19002@gmail.unpad.ac.id

ABSTRACT

Background: acute Coronary Syndrome patients often return to the hospital due to relapses that occur after they are declared cured. Secondary prevention programs are an important part for ACS patients to treat and stop the disease process and prevent them from complications and disability. Nurses have an important role in carrying out secondary prevention, especially for ACS patients to train patients to live a healthy lifestyle.
Purpose: the purpose of this review study was to map and explore the implementation of secondary prevention in acute coronary syndrome patients initiated or coordinated by nurses.
Methods: this study used scoping review design by including all full-text primary studies written in English and published in the last 10 years from 7 sources including EBSCO-hosted Academic Search Complete, PubMed, ScienceDirect, Sage Journals, Taylor and Francis, ProQuest, and Google Scholar. All study results were extracted manually using the tabulation method and analyzed thematically.
Results: nurses can support secondary prevention through LDL reduction and lifestyle modifications. LDL reduction involves lipid-lowering medications, the NAILED-ACS approach, and Nursing Coordinated Care (NCC). Lifestyle modifications include promoting healthy habits, ensuring medication adherence, counseling for smoking cessation, and implementing programs for weight loss and physical activity.
Conclusion: secondary prevention initiated or coordinated by nurses in the form of LDL reduction intervention and lifestyle modification program have been shown to be effective in reducing the risk of recurrent ischemia in patients with acute coronary syndrome.

Keywords:
Acute coronary syndrome; nurse-led; secondary prevention

BACKGROUND

The prevalence of non-communicable diseases is increasing and occupying the first position as the highest cause of death in the world (Rachmawati et al., 2021). Cardiovascular disease or PJPD (Penyakit Jantung dan Pembuluh Darah) is a condition in which the heart and blood vessels cannot function normally due to interference, giving rise to problems such as coronary heart disease, congenital heart disease, heart failure, stroke, and hypertension. According to WHO the global death rate from PJPD alone reached 17.3 million people in 2008 (Nurwidyaningtyas et al., 2014). Then this number increased to 17.9 million deaths in 2016 and it is estimated that the PJPD death rate will continue to increase sharply in 2030 to 23.3 million deaths. In Indonesia, cardiovascular disease has also been ranked first as the highest leading cause of death with a total death rate of around 21.1% caused by stroke and 12.9% caused by coronary heart disease (Rachmawati et al., 2021).

The reason coronary heart disease can cause death is because of the emergence of ACS (Acute Coronary Syndrome). ACS itself is part of the clinical manifestations of CHD which is a serious cardiac condition and requires immediate treatment. ACS occurs due to ischemic conditions in the myocardium (heart muscle) which causes a set of manifestations due to coronary atherosclerosis and leads to acute myocardial infarction (Torry et al., 2014). The clinical symptoms that appear in ACS are characteristic chest pain; the nature of the pain such as being pressed, burning, being crushed by a heavy object, being stabbed, squeezed, twisted; the location of the pain is substernal, retrosternal, precordial and pain can radiate to the left arm, neck, lower jaw and back; chest pain can still be felt when resting or doing light activities; pain can improve or disappear if rested or given nitrate drugs; the trigger factor is due to physical exercise, emotional stress, cold air, after eating; and other accompanying symptoms are nausea, vomiting, difficulty breathing, cold sweat, anxiety, weakness, and difficulty resting (Hendriarto, 2019). The problem that often arises in patients with ACS (Acute Coronary Syndrome) is that patients often experience cold sweats, shortness of breath, headaches, and dizziness such as wanting to faint, nausea or vomiting, anxiety, and irregular heartbeats (arrhythmias). Under such conditions, patients with ACS often return to the hospital even though they were previously declared cured, but this does not rule out the possibility of appearing with different complaints in each patient.

To prevent the occurrence or recurrence of ACS patients, a healthy and good lifestyle for the heart is not smoking and consuming alcohol, consuming healthy foods, maintaining an ideal body weight, avoiding, and controlling stress properly, and exercising regularly. Whereas ACS patients who have risk factors such as hypertension, high cholesterol, or diabetes, it is recommended to routinely control according to the specified schedule so that the body's health condition is always monitored and consume drugs given by doctors regularly so that the disease remains under control and does not cause complications of acute coronary syndrome. According to Winslow, professor of public health from Yale University (1920) in Maulana 2013, there are three stages of prevention to address health problems including disease, namely primary, secondary, and tertiary prevention. The main goals of secondary prevention are treating and stopping the disease process, healing the sick and preventing complications and disability (Reni, 2018). Meanwhile, secondary prevention in patients with acute

coronary syndrome is to prevent recurrent attacks and extend the patient's life expectancy.

Some secondary prevention recommendations that have proven to be beneficial for patients who have recovered from an attack of acute coronary syndrome include: controlling risk factors and administering drugs whose efficacy has been proven, for example: aspirin, P2Y12 receptor blockers, beta blockers, statins, angiotensin converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs), and aldosterone inhibitors. Patient adherence to long-term treatment is also an important issue for achieving therapeutic goals. Patient involvement in secondary prevention or cardiac rehabilitation programs can improve patient compliance (Irawati, 2013). Nurses have an important role in carrying out secondary prevention, especially for ACS patients to train patients to live a healthy lifestyle.

OBJECTIVE

This scoping review aims to map and explore the implementation of secondary prevention in acute coronary syndrome patients initiated or coordinated by nurses.

METHODS

Scoping review was carried out based on the framework adapted from Arksey & O'Malley in 2005. This method is considered to have a wider conceptual reach so that it can explain the results of various studies that discuss secondary prevention in acute coronary syndrome patients initiated by nurses (Tricco et al., 2018). The framework consists of 5 core stages, namely identification of research questions, identification of relevant study results, selection of studies, mapping of data, compilation, summarizing, and reporting of results.

The article search process was carried out through 7 sources including 4 databases and 3 e-resources, namely EBSCO-hosted Academic Search Complete, PubMed, ScienceDirect, Sage Journals, Taylor and Francis, ProQuest and Google Scholar based on certain keywords according to the MeSH Term and PCC framework (see table 1.)

Table 1. Articles searching strategy based on the PCC's framework

PCC's Framework	Keyword
Population	Acute Coronary Syndrome OR Acute Coronary Syndrome Patients
Concept	Nurse-led OR Nurse-coordinated OR Nursing Practice Patterns
Context	Secondary Prevention

This scoping review will consider full-text English primary research articles published within the last 5 years (2017 – 2022). Studies The types of research used included randomized and non-randomized controlled trials, quasi-experimental, and cross-sectional studies.

The methodological validity of the study was tested using the Joanna Briggs Institute (JBI) instrument to obtain studies of the highest quality or with minimal bias. Articles are declared eligible if they meet the assessment criteria >60%.

The selection of study results was based on the PRISMA Extension for Scoping Reviews (PRISMA-ScR) Protocol: (1) identify duplications; (2) selection based on title and abstract; (3) check availability of full text; and (4) filter study results based on inclusion and exclusion criteria (Figure 1). All study results were extracted manually using the tabulation method and analyzed thematically.

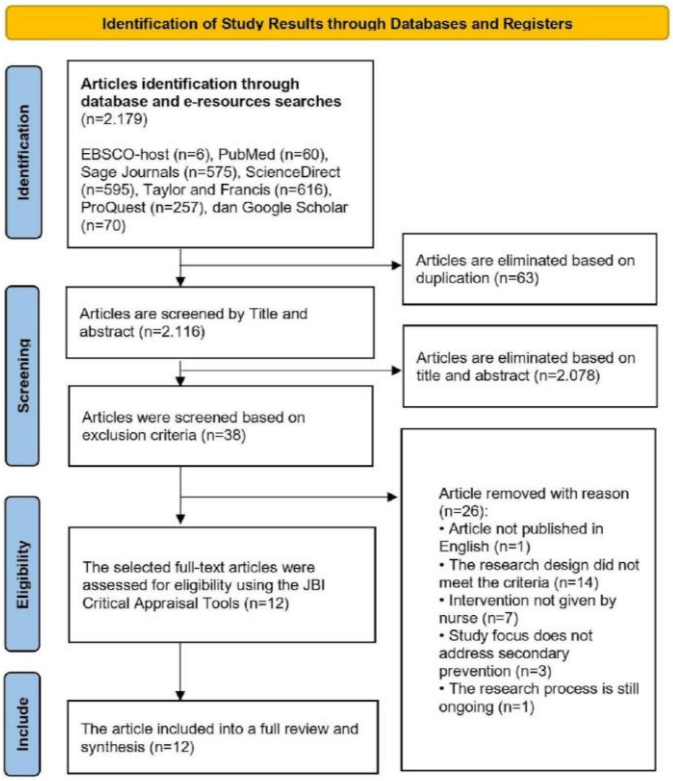

Figure 1. PRISMA Flow Diagram

RESULTS

A total of 2,179 studies have been identified and 12 articles included in this scoping review for further analysis and discussion. The study designs used in this study included cross-sectional (n=1), quasy experimental (n=1), and randomized control trials (RCT) (n=10). This study involved adult to elderly participants with a history of Acute Coronary Syndrome (ACS). The age range of the respondents ranged from 40-82 years. The study was conducted in 4 different countries namely the Netherlands, Sweden, Iran, and India.

Table 2. Study Characteristic

No	Author	Method	Country	Age	Participant	Follow-up period	Critical Appraisal
1.	Schaik et al., 2017	Cross-sectional	Netherlands	47-65 years	201 patients with STEMI and NSTEMI myocardial infarction, and unstable angina.	4 months	6/8 (75,0%)
2.	Ruiz-Bustillo et al., 2019	RCT	Netherlands	54-71 years	78 hospitalized patients with STEMI and NSTEMI myocardial infarction, unstable angina, and stable angina.	1 year	9/13 (69,2%)
3.	Snaterse et al., 2017	RCT	Netherlands	48-68 years	754 patients who have been discharged after experiencing acute coronary syndrome (ACS).	1 year	9/13 (69,2%)
4.	Huber et al., 2017	RCT	Sweden	57-81 years	841 patients with type 1 acute myocardial infarction or unstable angina with electrocardiographic changes suggestive of ischemia.	1 year	9/13 (69,2%)
5.	Henriksson et al., 2021	RCT	Sweden	57-82 years	797 patients with STEMI, NSTEMI, and unstable angina.	3 years	9/13 (69,2%)
6.	Snaterse et al., 2019	RCT	Netherlands	49-67 years	824 patients who were hospitalized because of ACS and had one of the lifestyle risk factors.	1 year	9/13 (69,2%)
7.	Huber et al., 2019	RCT	Sweden	Mean: 68 years	962 patients with acute coronary syndrome (ACS) who were hospitalized.	3 years	9/13 (69,2%)
8.	Bagheri et al., 2022	RCT	Iran	51-69 years	120 patients who were hospitalized with a diagnosis of ACS and poor self-efficacy scores.	1 month	10/13 (76,9%)
9.	Minne-	RCT	Netherlands	Mean:	711 patients with	1 year	9/13

No	Author	Method	Country	Age	Participant	Follow-up period	Critical Appraisal
	boo et al, 2017			58,7 years	acute coronary syndrome (ACS) and/or revascularization after < 8 weeks of hospitalization.		(69,2%)
10.	Kavita et al., 2020	Quasi Experiment	India	Mean: 40 years	402 patients with hypertension for primary prevention and 500 patients with myocardial infarction, angina, or CABG/PTCA for secondary prevention.	1 year	8/9 (88,9%)
11.	Tijssen et al, 2021	RCT	Netherlands	49-68 years	537 patients who had been hospitalized with coronary artery disease.	1 year	9/13 (69,2%)
12.	Irewall et al, 2021	RCT	Sweden	63-78 years	1890 patients with myocardial infarction and unstable angina.	3 years	9/13 (69,2%)

Table 3. Summary of Study Results

No	Author	Objective	Intervention	Finding
1.	Van Schaik et al, 2017 (van Schaik et al., 2017)	to explore the association between health awareness and cardiovascular disease (CVD) risk as well as to assess the differential effect with health literacy level of a nurse-coordinated secondary prevention (NCPP) program in patients with coronary artery disease (CAD).	At each visit, patients are examined by specialist nurses trained to carry out NCPP which focuses on activities promoting healthy lifestyles, managing biometric risk factors, and medication adherence. The program was conducted over four visits during the first six months after inclusion.	Patients with low health literacy have a significantly worse risk of CVD and the implementation of NCPP is considered effective for patients with low health literacy to offer a promising concept of CVD secondary prevention.
2.	Ruiz-Bustillo et al, 2019 (Ruiz-Bustillo et al., 2019)	To evaluate the six-month efficacy of an intensive lipid-lowering intervention, coordinated by the nurse and carried out after discharge from the	Nurses provide additional post-discharge interventions by controlling serum lipid levels at 3 and 6 months after discharge, evaluating laboratory test results, prescribing, and	The results showed that LDL⩽100 mg/dL cholesterol, target LDL⩽ cholesterol⩽70 mg/dL, and LDL cholesterol reduction of⩾50% could be achieved in the

No	Author	Objective	Intervention	Finding
		hospital, in patients admitted to the hospital for an ischemic heart event.	administering additional/alternative lipid-lowering medications, as well as permanent communication (phone, email) regarding laboratory test results and therapeutic changes during the intervention.	intervention group compared to the standard ascare group. This suggests that there is an opportunity for nurse-led interventions to represent management goals in patients with ischemic heart disease.
3.	Snaterse et al., 2017 (Snaterse et al., 2017)	Evaluating LDL-C targets between groups monitored for drug titration activity (Up/Down) or agent use, and drug dosage based on average lipid reduction potential (ALLP) coordinated by nurses in the NCC (Nursing Coordinated Care) program with the usual care group without nurse coordination	Patients under NCC attended the outpatient clinic 4 times during the first 6 months in addition to visits with cardiologists compared to patients who only had usual care (specialist visits). During visits to the NCC program, nurses carry out assessments, lipid profiles, and medication evaluations, medication adherence, healthy lifestyle support and drug titrations in collaboration with cardiologists.	Patients with the NCC program showed good results on the LDL-C target because the group of patients with NCC received more intensive drug titrations compared to the LDL-C target in the group of patients with usual care at the 6th and 12th months since the program started.
4.	Huber et al., 2017 (Huber et al., 2017)	to evaluate the results of low-density lipo-protein cholesterol (LDL-C), systolic blood pressure, and diastolic blood pressure after the Nurse-Based Age-independent Intervention to Limit Evolution of Disease after Acute Coronary Syndrome (NAILEDACS) trial for 12 months.	The nurse counsels the patient regarding lifestyle risk factors such as diet, exercise, and smoking cessation through necessary, according to the blood pressure and blood lipid measurements, the nurse and physician study together to make medical adjustments. Routines continue to be repeated until the target of secondary prevention is not achieved.	Through the NAILED intervention, patients could contact nurses at will, but no contact is planned yet. The effect of the intervention was more pronounced after the initial titration and decreased over the first 12 months
5.	Henriksson et al, 2021 (Henriksson et al., 2021)	Testing whether nurse-based telephone interventions are better than usual care in controlling risk factors for SBP, DBP and LDL-	1) Group intervention: counseling on the importance of medical compliance, physical activity, exercise, smoking cessation, and dietary advice over the	After 36 months of follow-up, the nurse-led telephone-based intervention resulted in significantly lower SBP, DBP, and LDL-C values

No	Author	Objective	Intervention	Finding
		C, and in achieving a higher proportion of patients who achieve set target BP and LDL-C levels.	phone. 2) Control group: measurement of BP and LDL-C, interviews, measurement of blood lipids, and blood pressure.	and increased the proportion of patients on target.
6.	Snaterse et al, 2019 (Snaterse et al., 2019)	To investigate the characteristics of successful smoking cessation, use of smoking cessation programs and use of other lifestyle interventions to improve lifestyle-related risk factors, in a nurse-coordinated care program.	The nurse refers 3 lifestyle programs, namely smoking cessation counseling, weight loss program, and physical activity program to patients who show that they are motivated for short-term improvement (determined within one month) based on the results of the interview.	There was no statistically significant difference in the discontinuation rate (50% intervention group vs 46% usual care group, P = 0.45). Most patients who successfully quit smoking are those who quit immediately after being admitted to the hospital, without the need to join a smoking cessation program.
7.	Huber et al, 2019 (Daniel et al., 2019)	To prospectively measure long-term adherence to statins in the Age-independent Nurse-based Intervention to Limit Disease Evolution after Acute Coronary Syndrome (NAILED ACS) trial and assess whether the intervention improves adherence compared to usual care.	The intervention group was provided with nurse-led yearly follow-up and medical titrations over the phone to achieve established intervention targets and one with usual care.	Nurse-based long-term follow-up with medical titration over the phone after ACS resulted in higher adherence to statin treatment compared to usual care, although most patients were treated with high-intensity LDL-C-lowering regimens. resulting in lower average LDL.
8.	Bagheri et al, 2022 (Bagheri et al., 2022)	To examine the effect of nurse-led counseling and education using the PCC approach on short-term cardiac efficacy in ACS patients.	The participants in the control group received routine care. Routine care includes information and education provided by nurses during discharge through verbal education and information pamphlets about diet, medications and cardiac symptoms that require special attention.	This study demonstrates that providing a nurse-led educational and counseling program using the PCC approach can improve short-term cardiac self-efficacy in patients with ACS.
9.	Minne-boo et al, 2017	To evaluate the impact of combining community-based	Patients in the intervention group were assigned by nurses to lifestyle programs	ACS patients who are coordinated by nurses to run a comprehensive

No	Author	Objective	Intervention	Finding
	(Minnebo o et al., 2017)	lifestyle programs with regular hospital-based secondary prevention.	aimed at reducing body weight, increasing physical activity, and ending smoking. Distribution of the number and sequence of interventions is based on the risk profile and preference of the patient.	lifestyle program show an increase in LRFs (lifestyle-related risk factor).
10.	Kavita et al., 2020 (Kavita et al., 2020)	Modification of CVD risk and treatment adherence are outcomes of interest for primary and secondary prevention of CVD respectively.	A total of 402 patients aged 40 years and over with hypertension (HTN) were recruited for primary prevention of CVD from OPDs, and the researchers. In the primary prevention group, there was a significantly higher proportion of participants in the low-risk category (70%) compared to baseline (60.6%) at 1 year follow-up. Whereas in the secondary prevention group the mean medication adherence score among participants in the intervention group (7.60) was significantly higher than that in the comparison group (5.96) with a large effect size of 1.1 ($p < 0.01$).	The results showed a high degree of agreement ($k = 0.84$) between the risk scores generated by the nurses and the researchers. In whereas 500 patients who had undergone CABG/PTCA were recruited from cardiology OPDs for secondary prevention of CVD and randomized to intervention ($n = 250$) and a comparison group ($n = 250$) using block randomization.
11.	Tijssen et al, 2021 (Tijssen et al., 2021)	To study the effect of a comprehensive secondary prevention program on weight loss and to identify the determinants of weight change in patients with coronary artery disease (CAD).	In addition to regular treatment, patients are offered to participate in 3 free programs, namely community-based healthy lifestyle programs to achieve weight loss (Weight Watchers), Increase levels of physical activity (Philips DirectLife) and quit smoking (Luchtsignaal).	A coordinated approach of care with a comprehensive secondary prevention program, has shown results leading to significant improvements in achieving weight loss in CAD patients.
12.	Irewall et al, 2021	To prove that the action of NAILED CV (Nurse-	The NAILED-CV intervention is carried out by	The results of the study showed that long-term

No	Author	Objective	Intervention	Finding
	(Anna-Lotta et al., 2021)	based, Age-independentnurses by systematicallyNAILED-CV Intervention to Limitfollowing up by phone withintervention by nurses in Evolution ofpatients regardingpatients with Cardiovascular Disease)medication adherence andcardiovascular disease can reduce the risk ofmatters related to patientcan reduce the incidence stroke, myocardiallifestyle modifications.of stroke, myocardial infarction, cardiacIntervention is carried out ininfarction, cardiac revascularization, andthe long term until therevascularization, and cardiac death in patientstreatment target is achieved,cardiac death. So that with cardiovascularnamely BP and the patient'sNAILED-CV can be disease. LDL-C level drops to aused as a secondary certain value. prevention effort that can be done by nurses in reducing morbidity and mortality in patients with cardiovascular disease.	

DISCUSSION

Patients with Acute Coronary Syndrome (ACS) have a 20% higher risk of having a recurrent ischemic event within 5 years than people without coronary heart disease. One way to prevent ischemic recurrence is secondary prevention treatment. Secondary prevention is screening to identify disease at an early stage (before signs and symptoms appear) through actions such as measuring blood pressure, mammography, and others. (Prevention, 2019). Secondary prevention treatments for ACS patients such as behavioral advice (diet, exercise and smoking cessation) and cardioprotective drugs (aspirin or other antiplatelet agents, beta-blockers, statins, angiotensin converting enzyme (ACE) inhibitors or angiotensin II receptor blockers) are effective in reducing recurrent ischemic risk (Chow et al., 2019).

Secondary prevention is carried out to identify the disease at an early stage before the appearance of signs and symptoms through a special measure. One special follow-up in patients with cardiovascular disease is to focus on lowering lipids. These lipid-lowering interventions could build on preexisting programs such as nurse-coordinated multi-disciplinary cardiac rehabilitation programs (Ruiz-Bustillo et al., 2019). The patient-controlled serum lipid levels at 3 and 6 months after discharge from the hospital and took additional lipid-lowering medication regularly, as well as communicated with nurses by telephone or e-mail regarding therapeutic changes that occurred during the intervention. A significant decrease in LDL cholesterol was achieved in the intervention group compared to the standard care group, so it has been shown to improve LDL cholesterol control after discharge (Ruiz-Bustillo et al., 2019). In addition, telephone-based follow-up can also be carried out using the NAILED-ACS approach (Henriksson et al., 2021; Huber et al., 2017, 2019). Based on research, this intervention is carried out by nurses by providing counseling about the importance of adherence and persistence to pharmacological treatment and matters related to lifestyle such as physical activity, exercise, appropriate diet, and smoking cessation. In addition, patients are also measured for systolic blood pressure (SBP), diastolic blood pressure (DBP), and LDL-C

to adjust drug titration administration until the treatment target is achieved.

The application of NAILED has the advantage of reducing risk factors. Based on studies, this intervention can significantly reduce LDL-C and DBP values during the first 12 months (Huber et al., 2017) and 36 months of follow-up (Henriksson et al., 2021) compared to usual care. With regard to LDL-C, other studies have also shown that reducing LDL-C by 1 mmol/L results in a relative reduction in the risk of cardiovascular death of around 20% (Silverman et al., 2016). In addition, the NAILED intervention can also improve adherence to statin treatment in the acute coronary syndrome (ACS) population (Huber et al., 2019). The use of statins in the secondary prevention of ACS has been studied to reduce low density lipoprotein cholesterol (LDL-C) as one of the most important factors in the atherosclerotic process. Thus, in addition to reducing the level of LDL-C in the body, telephone-based follow-up also indirectly reduces the risk of death in sufferers.

Different from the NAILED intervention in 3 previous studies that focused on the successful control of cardiovascular risk factors (Henriksson et al., 2021; Huber et al., 2017, 2019), Irewall et al. research (Anna-Lotta et al., 2021) focuses on improving follow-up to prevent long-term recurrence of cardiovascular events through NAILED-CV interventions. Nurse interventions in the study demonstrated a lower combined incidence of cardiovascular death, MI, stroke, and cardiac revascularization during long-term follow-up.

Another study with an intervention that was not much different from NAILED also showed positive results on the target of reducing LDL-C in patients with ACS. This intervention is NCC or Nursing Coordinated Care which emphasizes very intensive drug titration monitoring based on average lipid lowering potential or ALLP (Average Lipid Lowering Potency). The authors consider that drug dosing based on the recommended guidelines is not enough to achieve the target LDL-C in patients who are also recommended in the guidelines, because combining NCC with the recommended titration according to the guidelines will increase the target of reducing LDL-C to a greater extent in patients with ACS (Snaterse et al., 2017).

Patients with manifest coronary artery disease (CAD) are at high risk of recurrent coronary events and death. Secondary prevention strategies consist of a healthy lifestyle and optimal drug therapy led by nurses and related health professionals. Prevention programs to optimize therapy, adherence and risk factor management can be effective for all CAD patients, particularly those with low health literacy. Interventions adapted to low health literacy appear to be effective in increasing medication adherence. One of the programs used is the nurse-coordinated prevention program (NCPP). Referral to NCPP includes up to four visits during the first six months after inclusion. At each visit, the patient is examined by a trained specialist nurse. NCPP aims to improve the risk profile by focusing on promoting healthy lifestyles, managing biometric risk factors, and improving medication adherence. After attending NCPP, there was a change in mean SCORE for the intervention and control groups. This shows that the implementation of NCPP influences reducing the risk of CVD in individuals with low health literacy.

In addition, in patients with coronary artery disease, improvement of risk factors related to other lifestyles needs to be done, one of which is a lifestyle modification program as a strategy in stopping smoking behaviour. In this program, nurses will refer to 3 lifestyle programs, namely smoking cessation counselling, weight loss programs, and physical activity programs to patients who show that they are motivated for short-term improvements which are determined within one month based on interview results. However, it turns out that the results of this study indicate that most patients who quit smoking were those who did not participate in a lifestyle program to quit smoking or in this case the majority quit smoking because of motivation within themselves immediately after leaving the hospital without participating in a modification program. lifestyle. In fact, many smokers are unable to successfully quit smoking, regardless of the presence of these smoking cessation programs. In this sense, this means that the study could not demonstrate the effect of a nurse-coordinated telephone-based smoking cessation program, moreover, that the program is only enrolled in a minority of people who quit smoking after acute coronary syndrome and/or coronary revascularization (Snaterse et al., 2019).

However, a review in another study conducted by Minneboo et al stated that lifestyle modification programs aimed at reducing body weight, increasing physical activity, and ending smoking habits in patients who have a history of CAD influence increasing lifestyle-related risk factors. -related risk factor (LRF), which is associated with a significant reduction in the risk of recurrent CAD. The increase per LRF in this case was defined as a 5% weight loss, a 10% increase in 6-min-walking distance (6MWD) and in terms of urinary cotinine levels. The findings suggest that among patients with CAD, nurse-coordinated referral to a comprehensive suite of up to 3 widely available community-based lifestyle programs on top of usual care is more effective in improving LRF than usual care alone. One in 3 individuals in the intervention group managed to increase their LRF without decreasing in the others, an absolute increase of 11%, and a relative increase of 42% compared to the control group. This program can be successful because in its implementation, nurses explain the concept of risk and the impact of various interventions. In addition, repeated and consistent attention to risk and lifestyle in separate interventions can reinforce information and support patients in their efforts to change their daily routines (Minneboo et al., 2017).

Lifestyle programs to achieve weight loss, increase physical activity levels, and stop smoking are also implemented by Tijssen et al. (2021) (Tijssen et al., 2021). Unlike previous studies, this study reviewed the impact of the program on body weight and identified the determinants associated with changes in body weight. Body weight is a factor that needs to be considered in the risk of CAD. Excess weight gain can increase blood pressure, triglyceride levels, cholesterol, glucose resistance, and blood clotting. Increased blood pressure can make blood vessels susceptible to thickening and narrowing, then increased levels of triglycerides and cholesterol will trigger the appearance of plaque thrombosis in blood vessels. If this happens to the coronary arteries it will cause CAD (Ghani et al., 2016). The study conducted by Tijsen et al (2021) assessed body weight, BMI, body fat percentage, waist circumference, blood pressure (systolic and diastolic), cholesterol (total cholesterol, LDL-C, HDL-C,

triglycerides), fasting glucose, and HbA1c as a measure of weight management carried out. From the interventions carried out, these values have improved even though there are values that are not too significant. Furthermore, regarding the determinants of weight change, weight loss is associated with age over 65 years, lower education level, non-smoking status, motivation to start with weight loss immediately after the initial visit and participation in a weight loss program. Meanwhile, weight gain was associated with smoking cessation 6 months before or during hospitalization, non-Caucasian ethnicity, smoking at baseline, age under 65 years and not participating in a weight loss program. Based on the results of the intervention on weight changes, this lifestyle program to achieve weight loss, increase physical activity levels, and stop smoking is quite effective in reducing the risk of CAD, which is related to weight problems and the factors that have been found can be used as consideration in management. subsequent weight gain to reduce the risk of CAD.

In addition to lifestyle modification programs, other nurse-led interventions that are also effective are interventions by modifying risk and increasing treatment adherence between subjects for primary and secondary prevention in CVD. These subsequent interventions included CVD risk assessment and communication by trained nurses followed by three telephone reminders to reinforce risk reduction at 1, 3 and 6 months. There was a significant increase in the mean treatment adherence score (as per the MMAS-8 scale) from 6.12 at baseline to 7.60 at follow-up. Changes in medication adherence scores in the intervention group also show effect sizes. Thus, nurse-led interventions were effective in modifying risk and improving treatment adherence for both primary and secondary prevention of CVD, respectively (Kavita et al., 2020).

In addition to the lifestyle modification programs mentioned earlier, another study conducted by Bagheri et al (2022) related to counseling and health education interventions was found to be able to increase self-efficacy or self-efficacy of patients with ACS to maintain their heart function (Bagheri et al., 2022). This intervention is led by a nurse by conducting direct or face-to-face counseling and follow-up via telephone. Among the educational content provided includes risk factors and symptoms of heart disease, the effects of disease on life and how to deal with it, diet, complications and medication adherence, home care and rehabilitation programs, and modification of risk factors that can be done by patients (Bagheri et al., 2022).

Based on the found lifestyle modification interventions, all results in the intervention group gave positive results. Lifestyle modifications need to be considered for ACS patients to raise awareness, knowledge, and individual capacity in managing their heart health because they have a good impact in the long term.

CONCLUSION

Secondary prevention (secondary prevention) in ACS is screening for disease at an early stage (before the appearance of signs and symptoms) through an action to reduce the risk of recurrent ischemia. From the 12 literatures that the authors found, it can be concluded that one of the secondary prevention measures that can be performed by nurses in patients with cardiovascular disease is a nurse's intervention that focuses on reducing LDL and preventing ACS through lifestyle. Interventions in order to reduce

LDL are carried out by taking additional lipid-lowering medications regularly, counseling by nurses using the NAILED-ACS approach, and NCC or Nursing Coordinated Care which emphasizes drug titration monitoring which will increase the maximum target of reducing LDL-C in patients with ACS. Other secondary prevention strategies are a healthy lifestyle and optimal drug therapy led by nurses and related health professionals. Nurse-coordinated prevention program (NCPP) programs can be carried out to promote healthy lifestyles, manage biometric risk factors and improve medication adherence, smoking cessation counseling, weight loss programs, and physical activity programs in patients who have a history of CAD which have an influence on improving lifestyle-related risk factor (LRF).

REFERENCES

Anna-Lotta, I., Anders, U., Anna, G., Joachim, Ö., & Mooe, T. (2021). Nurse-based secondary preventive follow-up by telephone reduced recurrence of cardiovascular events: a randomised controlled trial. *Scientific Reports (Nature Publisher Group)*, *11*(1). https://doi.org/https://doi.org/10.1038/s41598-021-94892-0

Bagheri, H., Shakeri, S., Nazari, A., Goli, S., Khajeh, M., Mardani, A., & Vlaisavljevic, Z. (2022). Effectiveness of nurse-led counselling and education on self-efficacy of patients with acute coronary syndrome: A randomized controlled trial. *Nursing Open*, *9*(1), 775–784. https://doi.org/https://doi.org/10.1002/nop2.1129

Chow, C. K., Brieger, D., Ryan, M., Kangaharan, N., Hyun, K. K., & Briffa, T. (2019). Secondary prevention therapies in acute coronary syndrome and relation to outcomes: observational study. *Heart Asia*, *11*(1).

Daniel, H., Christian, W., Robin, H., Lars, S., & Thomas, M. (2019). Statin treatment after acute coronary syndrome: Adherence and reasons for non-adherence in a randomized controlled intervention trial. *Scientific Reports*, *9*(1), 1–10. http://10.0.4.14/s41598-019-48540-3

Ghani, L., Susilawati, M. D., & Novriani, H. (2016). Dominant Risk Factors of Coronary Heart Disease in Indonesia. *Buletin Penelitian Kesehatan*, *44*(3), 153–164.

Hendriarto, S. (2019). TINJAUAN PUSTAKA Patofisiologi Penyakit Jantung Koroner Coronary Heart Disease Pathophysiology. *Jurnal Anestesiologi Indonesia*, 209–224.

Henriksson, R., Huber, D., & Mooe, T. (2021). Nurse-led, telephone-based follow-up after acute coronary syndrome yields improved risk factors after 36 months: the randomized controlled NAILED-ACS trial. *Scientific Reports*, *11*(1), 17693. https://doi.org/10.1038/s41598-021-97239-x

Huber, D., Henriksson, R., Jakobsson, S., & Mooe, T. (2017). Nurse-led telephone-based follow-up of secondary prevention after acute coronary syndrome: One-year results from the randomized controlled NAILED-ACS trial. *PLoS ONE*, *12*(9), 1–12. http://10.0.5.91/journal.pone.0183963

Huber, D., Wikén, C., Henriksson, R., Lars, S., & Mooe, T. (2019). Statin treatment after acute coronary syndrome: Adherence and reasons for non-adherence in a randomized controlled intervention trial. *Scientific Reports (Nature Publisher Group)*, *9*, 1–10. https://doi.org/https://doi.org/10.1038/s41598-019-48540-3

Irawati, S. (2013). Penatalaksanaan Jangka Panjang Sindroma Koroner Akut Tanpa Elevasi Segmen ST. *Rasional*, *11*(2).

Kavita, Thakur, J. S., Vijayvergiya, R., & Ghai, S. (2020). Task shifting of cardiovascular risk assessment and communication by nurses for primary and secondary prevention of cardiovascular diseases in a tertiary health care setting of Northern India. *BMC Health Services Research*, *20*, 1–12. https://doi.org/https://doi.org/10.1186/s12913-019-4864-9

Minneboo, M., Lachman, S., Snaterse, M., Jørstad, H. T., ter Riet, G., Boekholdt, S. M., Scholte op Reimer, W. J. M., Peters, R. J. G., Riezebos, R. K., van Liebergen, R. A. M., van der Spank, A., van Dantzig, J. M., de Milliano, P. A. R., van Hessen, M. W. J., Kragten, J. A., Jaarsma, W., den Hartog, F. R., Bartels, G. L., Aengevaeren, W. R. M., … de Vries, C. J. (2017). Community-Based Lifestyle Intervention in Patients With Coronary Artery Disease: The RESPONSE-2 Trial. *Journal of the American College of Cardiology*, *70*(3), 318–327. https://doi.org/https://doi.org/10.1016/j.jacc.2017.05.041

Nurwidyaningtyas, W., Kholifah, S., & Rahma, A. (2014). Kajian Kelompok Risiko Tinggi: Studi Pendahuluan Pengembangan Model Pengendali Prevalensi Penyakit Kardiovaskular. *Jurnal Keperawatan Indonesia*, *17*(1), 18–24.

Prevention, C. for D. C. and. (2019). Picture of America: Prevention. *Retrieved August*, *8*, 2019.

Rachmawati, C., Martini, S., & Artanti, K. D. (2021). Analisis Faktor Risiko Modifikasi Penyakit Jantung Koroner Di Rsu Haji Surabaya Tahun 2019. *Media Gizi Kesmas*, *10*(1), 47–55.

Reni, R. (2018). Secondary Prevention Terhadap Motivasi Klien Hipertensi Dalam Pengontrolan Tekanan Darah. *Real In Nursing Journal*, *1*(1), 42–50.

Ruiz-Bustillo, S., Ivern, C., Badosa, N., Farre, N., Marco, E., Bruguera, J., Cladellas, M., Enjuanes, C., Cainzos-Achirica, M., Marti-Almor, J., & Comin-Colet, J. (2019). Efficacy of a nurse-led lipid-lowering secondary prevention intervention in patients hospitalized for ischemic heart disease: A pilot randomized controlled trial. *European Journal of Cardiovascular Nursing*, *18*(5), 366–374. https://doi.org/10.1177/1474515119831511

Silverman, M. G., Ference, B. A., Im, K., Wiviott, S. D., Giugliano, R. P., Grundy, S. M., Braunwald, E., & Sabatine, M. S. (2016). Association between lowering LDL-C and cardiovascular risk reduction among different therapeutic interventions: a systematic review and meta-analysis. *Jama*, *316*(12), 1289–1297.

Snaterse, M., Jorstad, H. T., Heiligenberg, M., Ter Riet, G., Boekholdt, S. M., Scholte Op Reimer, W., & Peters, R. J. (2017). Nurse-coordinated care improves the achievement of LDL cholesterol targets through more intensive medication titration. *Open Heart*, *4*(2), e000607. https://doi.org/10.1136/openhrt-2017-000607

Snaterse, M., Jorstad, H. T., Minneboo, M., Lachman, S., Boekholdt, S. M., Ter Riet, G., Scholte Op Reimer, W. J., & Peters, R. J. (2019). Smoking cessation after nurse-coordinated referral to a comprehensive lifestyle programme in patients with coronary artery disease: a substudy of the RESPONSE-2 trial. *European Journal of Cardiovascular Nursing : Journal of the Working Group on Cardiovascular Nursing of the European Society of Cardiology*, *18*(2), 113–121. https://doi.org/10.1177/1474515118795722

Tijssen, A., Snaterse, M., Minneboo, M., Lachman, S., Scholte Op Reimer, W., Peters, R. J., & Jørstad, H. T. (2021). Weight management and determinants of weight change in patients with coronary artery disease. *Heart*, *107*(19), 1552–1559.

https://doi.org/10.1136/heartjnl-2021-319224

Torry, S. R. V, Panda, L., & Ongkowijaya, J. (2014). Gambaran faktor risiko penderita sindrom koroner akut. *E-Clinic*, *2*(1).

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., … Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*, *169*(7), 467–473. https://doi.org/10.7326/M18-0850

van Schaik, T. M., Jørstad, H. T., Twickler, T. B., Peters, R. J. G., Tijssen, J. P. G., Essink-Bot, M. L., & Fransen, M. P. (2017). Cardiovascular disease risk and secondary prevention of cardiovascular disease among patients with low health literacy. *Netherlands Heart Journal : Monthly Journal of the Netherlands Society of Cardiology and the Netherlands Heart Foundation*, *25*(7–8), 446–454. https://doi.org/10.1007/s12471-017-0963-6