

THE EFFECTS OF SECONDARY PREVENTION IN PATIENT WITH CORONARY HEART DISEASE (CHD): A LITERATURE REVIEW

Gratsia Victoria Fernandez¹

¹Program Studi Ilmu Keperawatan, Fakultas Kedokteran, Universitas Sam Ratulangi

Email: gratiavictoria@unsrat.ac.id

ABSTRACT

Coronary Heart Disease (CHD) is the most common form of cardiovascular disease and one of the leading causes of death worldwide. Considering that CHD is chronic in nature, adherence to secondary prevention measures is needed to prevent the development of CHD in a worse direction, such as disability and disease recurrence. This study aimed to review the literature on secondary prevention and its effect on a patient with CHD. The search of literature used predefined keywords through several databases, namely Scopus, ProQuest, Science Direct and SAGE Journal. The inclusions are articles in full text, written in English, and published within the last five years from 2019 - 2023. The exclusions are non-experimental research literature and those that do not describe the impact of second prevention. The results show that there are fifteen articles that met the inclusion criteria. The second prevention can be given in various ways, and media can be used according to the patient's needs. This second prevention also provides many benefits for quality of life, self-efficacy, knowledge, adherence, self-care, health behavior, lifestyle, life orientation, optimism, physical activity, levels of anxiety and depression in patients controlling cholesterol levels and blood pressure. and reduce the occurrence of complications.

Keywords: Coronary Heart Disease, Effect, Secondary Prevention

INTRODUCTION

Coronary Heart Disease (CHD) is the most common form of cardiovascular disease and one of the leading causes of death worldwide (Sigamani & Gupta, 2022). Approximately 9 million people died from CHD in 2019, representing 16% of all deaths from all causes globally (WHO, 2020). According to the American Heart Association, the prevalence of CHD will increase by 18% from 2013 to 2030 (Chiang et al., 2018). CHD can impair a person's physical and psychosocial functioning and affect the quality of life of CHD patients (Chiang et al., 2018). Furthermore, CHD patients remain at increased risk for subsequent adverse cardiac events and poor long-term outcomes

(Patel et al., 2019).

Considering that CHD is chronic in nature, adherence to secondary prevention measures is needed to prevent the development of CHD in a worse direction such as disability and disease recurrence (Kähkönen et al., 2019). A key aspect of CHD care and secondary prevention is enabling patients to access and engage with evidence-based information and acquire knowledge related to their condition. With adequate and appropriate information, patients and relevant carers are better placed to make decisions and implement optimal behavioral changes (Zwack et al., 2023).

Secondary prevention of CHD is the prevention of recurrent coronary events after clinical diagnosis (Sigamani & Gupta, 2022). Secondary prevention focuses on preventing recurrent coronary events and prolonging life before symptoms appear (Antman, 2018).

There is strong evidence that secondary prevention by significantly modifying risk factors in CHD patients has beneficial effects, including reduced mortality, reduced heart attack recurrence, and improved quality of life (Gupta et al., 2018). With sufficient and relevant information, patients and relevant caregivers can make better decisions and implement optimal behavioral changes (Zwack et al., 2023). Therefore, this paper aimed to review the literature on secondary prevention and its effect on CHD patients.

METHOD

Search articles used the predefined keywords such as “Coronary Heart Disease” OR “Coronary Artery Disease” AND “Secondary Prevention” OR “Effect

Secondary Prevention” through four online databases such as Scopus, ProQuest, Science Direct and SAGE Journal. The determination of inclusion and exclusion criteria was based on the PICOS format (Table 1). This format was used to gain the proper journal to review.

Table 1. The PICOS Format

Criteria	Inclusion	Exclusion
Population	Patients with coronary disease or coronary artery disease	Not a coronary heart disease or coronary artery disease patient
Intervention	Second prevention for patients with coronary disease or coronary artery disease	Not a second prevention for patients with coronary heart disease or coronary artery disease
Comparators	No comparator	-
Outcomes	All variables related to the effect of second prevention	It does not describe the impact of second prevention
Research design, publication type	Experiment research. Published in full text	Non-experimental research, review, incomplete text article
Publication year	After 2018	Before 2018
Language	English	Non-English article

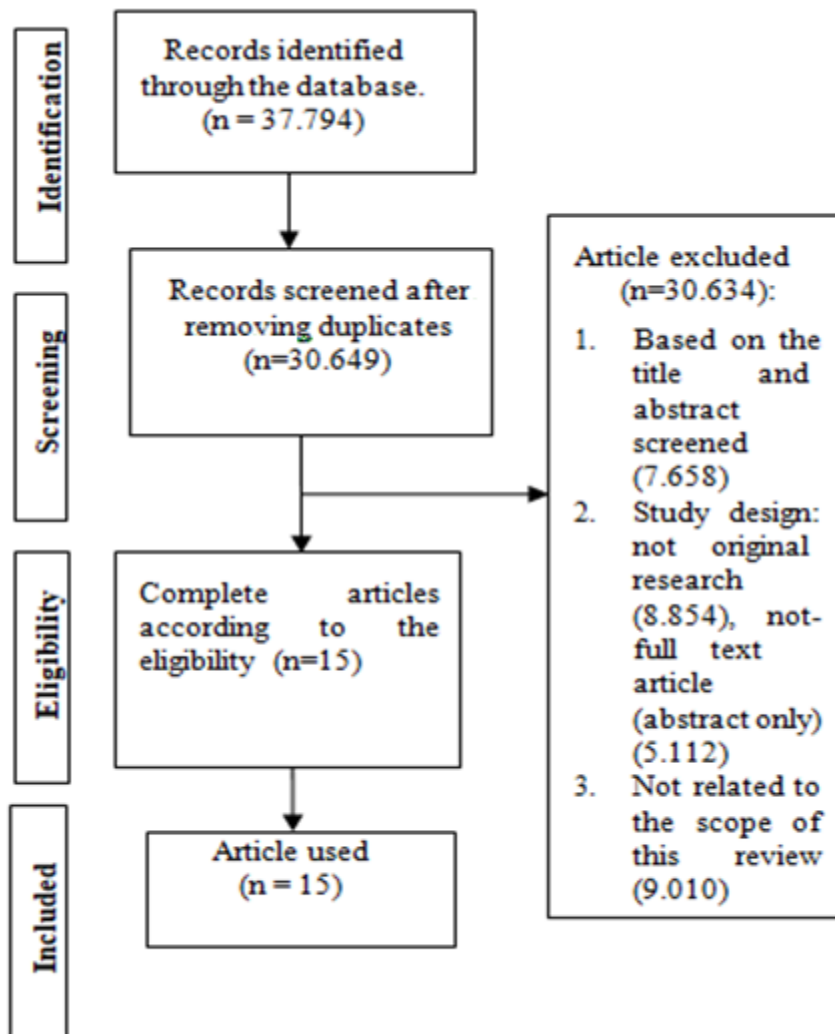


Figure 1. The selection process of literature based on the PRISMA Flow Diagram

RESULT

Articles were reduced and selected by reading the title and research abstract and based on inclusion and exclusion criteria. The relevant articles were then analyzed and reviewed, starting from the abstract,

synthesis and data analysis of the research questions (Figure 1).

The review results show the secondary prevention and related outcomes in patients with CHD as presented in Table 2.

Table 2. Article Review

No	Author	Intervention	Outcomes
1	Zhao & Wang, (2022)	Intervention group: daily care combined with integrated nursing care based on the medical alliance model. Control group: daily care. Time: 6 months	The results showed that the intervention group had a higher level of self-efficacy and self-management ability and a lower incidence of postoperative complications compared to the control group.
2	Sun et al., (2021)	Intervention group: daily care and Comfort care based on the collaborative care model (CCM) Control group: daily care Time: 2 weeks	The results showed that the intervention group had higher levels of knowledge, compliance, self-care, and comfort levels as well as lower levels of anxiety and depression compared to the control group.
3	Cao et al., (2022)	Intervention group: daily care during hospitalization and follow-ups after discharge and The HCF (Hospital-Community-Family) Based Integrated Healthcare Model Services Control group: daily care during hospitalization and follow-ups after discharge Time: 12 months	The results showed that the intervention group had lower recurrence and complication rates, as well as better treatment adherence, quality of life and risk factor control compared to the control group.
4	Shen et al., (2021)	Intervention group: nursing intervention based on Cox's interaction model of client health behavior and daily health education. Control group: daily health education Time: 12 weeks	The results showed that the intervention group had better health behaviors, higher levels of adherence and knowledge as well as better blood pressure and LDL levels compared to the control group.
5	Li et al., (2020)	Intervention group: daily care (only in relation to their physical health) and the transtheoretical model (TTM)-based intervention and motivational interviewing (MI) Control group: daily care (only in relation to their physical health) Time: The intervention was given 3 times of 30 minutes each (TTM) and 2 times of 20 minutes (MI)	The results showed that the intervention group had lower levels of depression than the control group.
6	Ruiz-Bustillo et al., (2019)	Intervention group: Usual post-discharge follow-up, inclusion in the standard cardiac rehabilitation program (CRP), plus nurse-led lipid-lowering secondary prevention intervention Control group: The 'standard care arm' involved usual post-discharge follow-up, plus follow-up by a primary care cardiologist for a limited period of time; and the standard CRP. Time: 6 months	The results showed that the intervention group had more controlled blood pressure and cholesterol levels compared to the control group.
7	Tok Yildiz & Kaşıkçı, (2020)	Intervention group: education with training booklet 30-45 min Control group: receive a home visit for 15-30 minutes while having blood pressure measured. Time: 6 months	The results showed that the intervention group had better levels of self-care and quality of life compared to the control group.

No	Author	Intervention	Outcomes
8	Weschenfelder et al., (2022)	Intervention group: received a healthy diet and pecan nut and extra virgin olive oil. Control group: received a healthy diet. Time: 3 months	The results showed that the intervention group had lower IL-6 levels compared to the control group.
9	Bernal-Jiménez et al., (2021)	Intervention group: access to application EVITE project and usual care Control group: usual care Time: 9 months	The results showed that the intervention group had better healthy behaviors and lifestyles compared to the control group.
10	Campos et al., (2020)	Intervention group: received a healthy diet and pecan nut and extra virgin olive oil. Control group: received a healthy diet according to the nutritional guidelines. Time: 12 weeks	The results showed that the PNG intervention group had lower non-HDL cholesterol levels compared to the control group.
11	Bosselmann et al., (2020)	Intervention group: Blended Collaborative Care (BCC) followed by standard medical care. Control group: standard medical care followed by Blended Collaborative Care (BCC). Time: 12 months	The results showed that in the intervention group there was a decrease in risk factors compared to the control group.
12	Shi et al., (2022)	Intervention group: multidisciplinary exercise management Control group: routine care Time: 2 months	The results showed that the intervention group had better levels of compliance, knowledge and social support compared to the control group.
13	Kuchi et al., (2023)	Intervention group: took part in the empowerment program. The control group did not take part in the study. Time: 8 weeks	The results showed that the intervention group had a better level of life orientation and optimism than the control group.
14	Zhang & Zhang, (2022)	Intervention group: comprehensive nursing intervention based on self-disclosure (CNISD) Control group: usual care. Time: 3 months	The results showed that the intervention group had better levels of sleep quality, quality of life, physical activity, levels of anxiety and depression as well as relapse and mortality rates compared to the control group.
15	Pitta et al., (2022)	Intervention group: educational cardiac rehabilitation program, based on (Social Cognitive Theory) SCT. Control group: usual care. Time: 3 months	The results showed that the intervention group had higher levels of physical activity and self-efficacy compared to the control group.

DISCUSSION

As the main finding of the selected fifteen studies, it was found that secondary prevention can be done with integrated nursing care, comfort care, integrated health

care model program, management of depression, lipid-lowering intervention, educational program, healthy diet, physical comfort care, intervention involving an online health application, blended collaborative care, the empowerment

programs, comprehensive nursing intervention based on self-disclosure and exercise management.

Integrated nursing care in the research done by Zhao & Wang (2022) used a medical alliance model that was carried out together with a team consisting of specialist doctors such as cardiologists, cardiac surgeons. Besides that, there are also nutritionists, nurses, and psychological consultants to form integrated care that can bring a good impact for CHD patients, including increasing self-efficacy and self-management and reducing complications. Comfort care in the research by Sun et al., (2021) is carried out by examining the causes of patient discomfort and then carrying out comfort care according to the patient's needs, so as to increase compliance, self-care, comfort and reduce anxiety and depression.

The HCF-based integrated health care model program in the research by Cao et al., (2022) is a comprehensive health service that does not only involve patients, but also family, communities and hospitals. It can be used as secondary prevention for CHD patients which may impact the level of lower recurrence and complications, as well as better treatment adherence, quality of life,

and risk factor control. Nursing intervention based on Cox's interaction model of client health behavior in the research by Shen et al., (2021) is a nursing intervention that provides information about CHD, increase self-care skills, offers emotional support, and improves decision-making skills among patients, so as to improve health behavior, compliance and knowledge.

The Transtheoretical Model (TTM)-based intervention and motivational interviewing (MI) in the research by Li et al., (2020) is a health behavioral change model which in this case places more emphasis on providing knowledge about CHD and depression management in patients, for the sake of reducing depression levels. Nurse-led lipid-lowering secondary prevention intervention in the research by Ruiz-Bustillo et al., (2019) is the management of lipid levels which consists of controlling and evaluating lipid levels in patients with ischemic heart disease, with the aim of controlling blood pressure and cholesterol.

In this review, there are two educational programs being examined. The first is an educational program that uses a training booklet in accordance with Orem's Self-Care Deficit Nursing Theory (SCDNT), and the second is an educational cardiac

rehabilitation program, based on SCT. The training program based on Orem's SCDNT is a program to increase knowledge regarding how to do self-care and improve the quality of life in CHD patients (Tok Yildiz & Kaşıkçı, 2020). The educational cardiac rehabilitation program, based on SCT, emphasize more on providing knowledge about nutrition, risk factor management, the dangers of smoking, the need for psychosocial support and physical activity (Pitta et al., 2022). The two educational programs above can improve self-care, quality of life, self-efficacy, and physical activity levels.

In this review, it was found that adding pecan nuts or extra-virgin olive oil to a healthy diet in CHD patients may also reduce atherogenicity and improve health among CHD patients (Weschenfelder et al., 2022). This is because pecans and olives have a cardioprotective effect (Campos et al., 2020). Furthermore, intervention involving a mobile health application (mHealth) in the research done by Bernal-Jiménez et al., (2021) consists of several components, including providing information about a healthy lifestyle, self-monitoring and motivate patients to improve and maintain a healthy lifestyle. With this application, CHD patients can have better

healthy behaviors and lifestyles.

Blended Collaborative Care in the research by Bosselmann et al., (2020) carried out long-term treatment management that is adjusted to the patient's mental condition and is carried out by nurses together with expert doctors. Thus, the intervention is expected to reduce risk factors in CHD patients. Mobile app-based multidisciplinary exercise management in the research by Shi *et al.*, (2022) is an application that can be a reminder for patients to exercise, monitor patients while exercising by displaying the patient's electrocardiogram and blood pressure scores. Patients can also do consultations and get health education through the application. With this application, the level of compliance, knowledge and social support in CHD patients are hoped to increase.

The empowerment

Programs in the research by Kuchi et al., (2023) begin with providing information and education to patients, and end with achieving patient participation in decision-making about the disease process. These programs are used to develop five main skills namely problem solving, decision-making, using resources, forming a therapeutic relationship between caregiver and patient, and activity

planning. This program aims to enhance the level of life orientation and optimism among patients in a better direction. Comprehensive Nursing Intervention Based On Self-Disclosure (CNISD) in the research by Zhang & Zhang, (2022) is a nursing service that emphasizes handling complications, care before surgery and after surgery in CHD patients which can improve sleep quality, quality of life, physical activity, anxiety and lessen the depression levels.

CONCLUSION

The second prevention in CHD patients can be done in various ways. It can also be carried out with several media, according to the patient's needs. This second prevention

also provides many benefits for quality of life, self-efficacy, knowledge, compliance, self-care, health behavior, lifestyle, life orientation, optimism, physical activity. Furthermore, it reduces levels of anxiety and depression of patients in controlling cholesterol levels and blood pressure. It also reduces the occurrence of complications in CHD patients. Importantly, interventions used as second prevention in CHD patients by nurses must be adjusted to the patient's needs and available resources, so that the second prevention results are more optimal. The limitations of this study are the selection of secondary prevention interventions which are quite broad and not yet focused. Hence, future research needs to highlight one of the secondary prevention interventions.

REFERENCES

- Antman, E. (2018). ST-segment elevation myocardial infarction. In *Harrison's Principles of Internal Medicine* (20th ed.). McGraw-Hill.
- Bernal-Jiménez, M. Á., Calle-Pérez, G., Gutiérrez-Barrios, A., Gheorghe, L., Solano-Mulero, A. M., Rodríguez-Martín, A., Tur, J. A., Vázquez-García, R., & Santi-Cano, M. J. (2021). Lifestyle and treatment adherence intervention after a coronary event based on an interactive web application (EVITE): Randomized controlled clinical trial protocol. *Nutrients*, 13(6). <https://doi.org/10.3390/nu13061818>
- Bosselmann, L., Fangauf, S. V., Herbeck Belnap, B., Chavanon, M. L., Nagel, J., Neitzel, C., Schertz, A., Hummers, E., Wachter, R., & Herrmann-Lingen, C. (2020). Blended collaborative care in the secondary prevention of coronary heart disease improves risk factor control: Results of a randomised feasibility study. *European Journal of Cardiovascular Nursing*, 19(2), 134–141. <https://doi.org/10.1177/1474515119880062>

- Campos, V. P., Portal, V. L., Markoski, M. M., Quadros, A. S., Bersch-Ferreira, C., Garavaglia, J., & Marcadenti, A. (2020). Effects of a healthy diet enriched or not with pecan nuts or extra-virgin olive oil on the lipid profile of patients with stable coronary artery disease: a randomised clinical trial. *Journal of Human Nutrition and Dietetics*, 33(3), 439–450. <https://doi.org/10.1111/jhn.12727>
- Cao, G., Xie, M., Xu, Y., Huang, J., Liang, J., Tao, B., & Yan, Q. (2022). A Quasi-Randomized Controlled Trial of an Integrated Healthcare Model for Patients with Coronary Heart Disease. *Reviews in Cardiovascular Medicine*, 23(7). <https://doi.org/10.31083/J.RCM2307234>
- Chiang, C. Y., Choi, K. C., Ho, K. M., & Yu, S. F. (2018). Effectiveness of nurse-led patient-centered care behavioral risk modification on secondary prevention of coronary heart disease: A systematic review. *International Journal of Nursing Studies*, 84(July 2016), 28–39. <https://doi.org/10.1016/j.ijnurstu.2018.04.012>
- Gupta, R., Khedar, R. S., Gaur, K., & Xavier, D. (2018). Low quality cardiovascular care is important coronary risk factor in India. *Indian Heart Journal*, 70, S419–S430. <https://doi.org/https://doi.org/10.1016/j.ihj.2018.05.002>
- Kähkönen, O., Saaranen, T., & Kankkunen, P. (2019). Adherence to Treatment of Female Patients With Coronary Heart Disease After a Percutaneous Coronary Intervention. *Journal of Cardiovascular Nursing*, 34(5), 410–417. <https://doi.org/10.1097/JCN.0000000000000592>
- Kuchi, Z. G., Matourypour, P., Esmaili, M., & Zakerimoghadam, M. (2023). Effect of an empowerment program on life orientation and optimism in coronary artery disease patients. *Iranian Journal of Nursing and Midwifery Research*, 28(1), 32–37. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10215543/>
- Li, X., Yang, S., Wang, Y., Yang, B., & Zhang, J. (2020). Effects of a transtheoretical model - Based intervention and motivational interviewing on the management of depression in hospitalized patients with coronary heart disease: A randomized controlled trial. *BMC Public Health*, 20(1), 1–12. <https://doi.org/10.1186/s12889-020-08568-x>
- Patel, R. S., Tragante, V., Schmidt, A. F., McCubrey, R. O., Holmes, M. V, Howe, L. J., Direk, K., Åkerblom, A., Leander, K., Virani, S. S., Kaminski, K. A., Muehlschlegel, J. D., Allayee, H., Almgren, P., Alver, M., Baranova, E. V, Behloui, H., Boeckx, B., Braund, P. S., ... Asselbergs, F. W. (2019). Subsequent Event Risk in Individuals With Established Coronary Heart Disease. *Circulation: Genomic and Precision Medicine*, 12(4), e002470. <https://doi.org/10.1161/CIRCGEN.119.002470>
- Pitta, N. C., Furuya, R. K., Freitas, N. D. O., Dessotte, C. A. M., Dantas, R. A. S., Ciol, M. A., Schmidt, A., & Rossi, L. A. (2022). Effect of an educational program on physical activity in individuals undergoing their first percutaneous coronary intervention: A randomized clinical trial. *Brazilian Journal of Physical Therapy*, 26(5). <https://doi.org/10.1016/j.bjpt.2022.100443>

- 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>
- Shen, Q., He, P., Wen, M., Yu, J., Chen, Y., Li, J., & Ouyang, X. (2021). Secondary prevention of coronary heart disease: The effect of a nursing intervention using Cox's interaction model of client health behaviour. *Journal of Advanced Nursing*, 77(10), 4104–4119. <https://doi.org/10.1111/jan.14930>
- Shi, Y. J., Liu, Y., Jiang, T. T., Zhang, H. R., & Shi, T. Y. (2022). Effects of multidisciplinary exercise management on patients after percutaneous coronary intervention: A randomized controlled study. *International Journal of Nursing Sciences*, 9(3), 286–294. <https://doi.org/10.1016/j.ijnss.2022.06.012>
- Sigamani, A., & Gupta, R. (2022). Revisiting secondary prevention in coronary heart disease. *Indian Heart Journal*, 74(6), 431–440. <https://doi.org/10.1016/j.ihj.2022.11.011>
- Sun, C., Jia, M., Wu, H., Yang, Q., Wang, Q., Wang, L., & Xu, H. (2021). The effect of comfort care based on the collaborative care model on the compliance and self-care ability of patients with coronary heart disease. *Annals of Palliative Medicine*, 10(1), 501–508. <https://doi.org/10.21037/apm-20-2520>
- Tok Yildiz, F., & Kaşıkçı, M. (2020). Impact of Training Based on Orem's Theory on Self-Care Agency and Quality of Life in Patients with Coronary Artery Disease. *Journal of Nursing Research*, 28(6). <https://doi.org/10.1097/JNR.0000000000000406>
- Weschenfelder, C., Gottschall, C. B. A., Markoski, M. M., Portal, V. L., Quadros, A. S. D., Bersch-Ferreira, Â. C., & Marcadenti, A. (2022). Effects of supplementing a healthy diet with pecan nuts or extra-virgin olive oil on inflammatory profile of patients with stable coronary artery disease: A randomised clinical trial. *British Journal of Nutrition*, 127(6), 862–871. <https://doi.org/10.1017/S0007114521001513>
- WHO. (2020). *WHO reveals leading causes of death and disability worldwide: 2000–2019*. News. <https://www.who.int/news/item/09-12-2020-who-reveals-leading-causes-of-death-and-disability-worldwide-2000-2019>
- Zhang, W., & Zhang, H. (2022). Effects of comprehensive nursing intervention based on self-disclosure on improving alexithymia in elder patients with coronary heart disease. *BMC Nursing*, 21(1), 1–7. <https://doi.org/10.1186/s12912-022-01006-w>
- Zhao, Y., & Wang, X. (2022). Effect of Integrated Nursing Care Based on Medical Alliance Mode on the Prevention and Treatment of Complications and Self-Efficacy of Patients with Coronary Heart Disease after PCI. *Journal of Healthcare Engineering*, 2022. <https://doi.org/10.1155/2022/7727953>

Zwack, C. C., Smith, C., Poulsen, V., Raffoul, N., & Redfern, J. (2023). Information Needs and Communication Strategies for People with Coronary Heart Disease : A Scoping Review. *International Journal of Environmental Research and Public Health*, 20(1723), 1–16. <https://doi.org/10.3390/ijerph20031723>