ORIGINAL ARTICLE

Care dependence and adherence to secondary prevention: Their effects on quality of life among patients with coronary heart disease

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ABSTRACT

Introduction*: Functional impairments in coronary heart disease (CHD) patients can lead to care dependency and hinder secondary prevention efforts. Patients with low care dependency and high adherence to secondary prevention may see improvements in their quality of life.*
Objectives*: To explore the relationship between care dependence, adherence to secondary prevention, and quality of life in CHD patients receiving outpatient care.*
Methods*: This quantitative cross-sectional study involved 120 CHD patients selected using purposive sampling. Data were collected using the Care Dependency Scale, the Medical Outcomes Study Specific Adherence Scale, and the Seattle Angina Questionnaire-7, and analyzed using the Spearman correlation test.*
Results*: Most respondents with very low care dependence (92.5%) and high adherence (86.6%) reported a high quality of life. Significant correlations were found (p=0.001; r=0.307; 95%CI 0.17-0.42 for care dependence; p=0.020; r=0.212; 95%CI 0.02-0.38 for adherence), indicating a moderately positive relationship between care dependence, adherence to secondary prevention, and quality of life.*
Conclusions*: Care dependence and adherence to secondary prevention were significantly related to quality of life in CHD patients. Healthcare providers should focus on reducing care dependence and improving adherence to secondary prevention. Practical recommendations include patient-centered education, enhanced follow-up care, and tailored support systems to help patients manage their condition and improve their quality of life.*

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1. Introduction

Coronary Heart Disease (CHD) is a chronic and progressive cardiovascular disease that poses a threat to people's lives worldwide (Roth et al., 2020). Approximately 9 million people died from CHD in 2019, representing 16% of all deaths from all causes globally (WHO, 2020). This global concern is also evident in Indonesia, where CHD is among the top ten causes of death. According to the Ministry of Health Indonesia, the national prevalence of CHD was 1.5%, with urban areas showing a higher burden (Wicaksono et al., 2025) . In North Sulawesi, particularly in the city of Manado, the incidence of CHD continues to increase, driven by lifestyle-related risk factors such as smoking, poor diet, and physical inactivity (Riskesdas Gorontalo, 2018). These national and regional trends emphasize the need for targeted prevention and management strategies to address the growing burden of CHD in Indonesia. According to the American Heart Association, the prevalence of CHD is expected to increase by 18% from 2013 to 2030 (Chiang et al., 2018). Rather than focusing solely on the number of cases, the growing prevalence of

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functional limitations among patients underscores the urgent need for strengthened secondary prevention and nursing support in outpatient cardiac care settings.

Care dependence in patients with CHD is described as the nurse-patient relationship, which results from a decline in self-care and a simultaneous increase in dependency on care (Piredda et al., 2020). It reflects a reduced ability to independently manage daily health tasks and an increased reliance on others for support. Examples include adherence to medication regimens, regular medical check-ups, and monitoring symptoms such as chest discomfort or shortness of breath (Yuan et al., 2024; Ozveren et al., 2021). However, adherence to secondary prevention measures such as taking prescribed medications and adopting heart-healthy lifestyle changes remains a challenge for many patients (Moutiris, 2024). Common barriers include experiencing side effects from medications, the financial burden of long-term treatment, forgetfulness, low health literacy, and the false perception of being "cured" once symptoms subside (Orozco-Moreno et al., 2024). These factors contribute to poor long-term adherence, highlighting the need for more tailored and supportive intervention (Bahit et al., 2023). Increased care dependence can affect a patient's social environment, overall health status, general clinical condition, physical function, and utilization of healthcare resources (Schulz et al., 2019).

Secondary prevention of CHD refers to preventing recurrent coronary events after a clinical diagnosis (Sigamani & Gupta, 2022). Adherence to secondary prevention measures, such as taking prescribed medications and making heart-healthy lifestyle changes, is crucial for patients with CHD (Lu et al., 2019). There is strong evidence that secondary prevention through significant risk-factor modification in CHD patients improves outcomes (Gupta et al., 2018). Secondary prevention focuses on preventing recurrent CHD events and extending life before symptoms reappear (Antman, 2018).

Functional impairments in patients with CHD can affect physical function and limit daily activities. They may also cause discomfort in everyday life. CHD requires individuals to adhere to a regular medication regimen, which can lead to feelings of boredom and inconvenience about medication adherence. This situation can negatively impact the quality of life for CHD patients (Chiang et al., 2018). Increasing care dependence, combined with suboptimal adherence, can negatively impact social functioning, physical capacity, and overall clinical stability. These issues underscore the need for targeted nursing interventions (Schulz et al., 2019).

Several studies conducted at RSUP Kandou Manado have shown that more than 50% of patients with coronary heart disease (CHD) do not adequately manage their condition, which may adversely influence their quality of life (Torawoba et al., 2021; Rumambi et al., 2018). However, to our knowledge, no previous research, as determined by a literature search in PubMed, Scopus, and Google Scholar using the keywords "care dependence", "secondary prevention", "quality of life", and "coronary heart disease" for the publication period 2013–2023, has specifically examined how care dependence and adherence to secondary prevention together relate to quality of life among CHD outpatients. This lack of research on the interconnectedness of these variables in this population reveals a significant gap that has not been addressed. Given the critical role of care dependence, adherence to secondary prevention, and quality of life in patients with CHD, this study aims to analyze the relationship between care dependence and adherence to secondary prevention with the quality of life of CHD outpatients at RSUP Kandou Manado. We hypothesize that greater independence (i.e., lower care dependency) and higher adherence to secondary prevention are associated with better quality of life.

2. Methods

This study was a quantitative, cross-sectional research design conducted in June 2024. The independent variables were care dependence and adherence to secondary prevention, while the dependent variable was quality of life. This design was used to examine the relationship between care dependence and adherence to secondary prevention on the quality of life of patients with CHD. The research location was the Cardiology Clinic at RSUP Prof. Dr. R. D. Kandou Manado. The population for this study consisted of patients with coronary heart disease (CHD) who met the inclusion criteria: diagnosed with CHD by a physician for ≥2 months based on clinical manifestations and Electrocardiogram (ECG) findings, willing to participate as respondents, and

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able to communicate effectively. The minimum 2-month duration was chosen to ensure that patients were in the acute or unstable phase for longer, allowing them to experience and adapt to their daily routines with the condition (Shahjehan et al., 2024). This time frame also ensured that patients had already received initial medical treatment and education, making it more feasible to accurately assess their level of care dependence, adherence to secondary prevention, and quality of life. Exclusion criteria included patients with dementia, those aged <18 or >90 years, and respondents who did not complete the questionnaire. The sampling technique used in this study was purposive sampling, with a total sample size of 120 respondents. The sample size was determined using the rule of thumb, which recommends a sample size of 5–10 times the number of indicators. In this study, 24 indicators were examined, resulting in a minimum required sample of 120 participants.

In this study, the researcher conducted face-to-face interviews using questionnaires. The questionnaire used in this study was the Care Dependency Scale, developed by Dijkstra et al. (1996), to measure the level of care dependence in patients with CHD. The Indonesian Version of the Care Dependency Scale adopted in this study was translated by Nursiswati et al. (2020). It consisted of 15 statement items, rated on a 5-point Likert scale from Independent (score 5) to Very Dependent (score 1). A score greater than 44 indicated Very Independent on care, while a score of 44 or less indicated Very Dependent on care. The Cronbach's alpha value for this questionnaire was 0.953.

The level of adherence to secondary prevention in patients with CHD was measured using the Medical Outcomes Study Specific Adherence Scale (MOS-SAS), developed by Ron D. Hays (1993). This scale consisted of 9 statement items, rated on a 6-point Likert scale from All of the Time (score 6) to Never (score 1). A total score of ≤ 32 indicated Non-Adherence, while a score greater than 33 indicated Adherence. The Cronbach's alpha value for this questionnaire was 0.77 (Lee et al., 2013). The quality of life for patients with CHD was determined using the Seattle Angina Questionnaire-7 (SAQ-7), developed by Chan et al. (2014). This instrument included 7 questions, utilizing a Likert scale, with scores below 50 indicating low quality of life and scores of 50 or higher indicating high quality of life. The Cronbach's alpha value for this questionnaire was 0.81.

After the data were collected, an analysis was conducted using the Spearman correlation test to examine the relationship between each variable by assessing the direction of the relationship, the correlation coefficient, and the level of significance (the significance level (α) of 5% or 0.050). The Spearman correlation test was chosen because the data were not normally distributed, as indicated by the Kolmogorov-Smirnov test (Sig. = 0.000). Statistical analysis was performed using SPSS 24.0 software.

3. Results and Discussion

In this study, the distribution of respondents by characteristics is shown in Table 1. According to Table 1, the majority of respondents were male (52.5%), nearly half were in late elderly (39.2%), most had a last level of education of high school (39.2%), and the majority had been suffering from CHD for 1-5 years (53.3%).

Table 1. Demographic Characteristics of Respondents

Characteristics	Frequency (n=120)	Percentage (%)
Gender		
Male	63	52,5
Female	57	47,5
Age		
26-35 years (Early adulthood)	3	2,5
36-45 years (Late adulthood)	12	10
46-55 years (Early elderly)	29	24,2
56-65 years (Late elderly)	47	39,2
>65 years (Elderly)	29	24,2
Education		
Elementary school	14	11,7

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Junior high school	21	17,5
Senior high school	47	39,2
Bachelor's degree	37	30,8
Master's degree	1	0,8
Length of time with heart disease		
<1 year	27	22,5
1-5 years	64	53,3
>5 years	29	24,2

Table 2 shows that most patients were relatively independent in performing daily self-care activities, such as maintaining personal hygiene, eating, and managing medications. Furthermore, respondents generally demonstrated a good level of adherence to secondary prevention, including taking prescribed medications, adopting healthy lifestyle changes (such as diet and physical activity), and attending regular medical check-ups. In addition, the majority of respondents also reported a high quality of life. However, the relatively large standard deviation indicates considerable variation in individuals' perceptions of their quality of life.

Table 2. The Descriptive Statistic of Care Dependence, Adherence to Secondary Prevention, And Quality of Life in CHD Patients

Variable	Frequency (n=120)	Percentage (%)	Mean	SD
Care Dependence			73.28	5.138
Very independent	120	100		
Very dependent	0	0		
Adherence to secondary prevention			42.58	5.737
Non-Adherent	9	7,5		
Adherent	111	92,5		
Quality of life			79.18	17.437
Low	9	7,5		
High	111	92,5		

Table 3 shows the statistical analysis yielded p-values of 0.001 and 0.020. Since both significance values are less than 0.05, this indicates a significant relationship between care dependence, adherence to secondary prevention, and the quality of life of patients with coronary heart disease. Additionally, the correlation coefficients were 0.307 and 0.212. These results suggest that the correlation is moderate and positive, indicating a direct relationship between the variables. Thus, it can be interpreted that the better the care dependence and adherence to secondary prevention, the higher the quality of life will be. Although there is a positive association, these variables account for only a limited portion of the variability in quality of life. The moderate strength of these associations suggests that other variables likely contribute to quality-of-life outcomes in CHD patients. For example, educational level has been shown to influence self-care practices and treatment adherence through enhanced health literacy (Du et al., 2022). Additionally, social and family support plays a pivotal role in providing emotional stability, aiding in medication adherence, and reducing psychological distress (Kim, 2022). Furthermore, the severity of CHD symptoms, such as frequent angina, fatigue, or shortness of breath, often reduces physical functioning and negatively affects perceived quality of life (Nurhamsyah et al., 2021). Psychological conditions such as anxiety and depression, which are highly prevalent in cardiac populations, are also known to be strong mediators of health-related quality of life, even when treatment adherence is optimal (Bhattarai et al., 2024). Lastly, socioeconomic status significantly influences health outcomes by affecting access to medications, affordability of follow-up care, and the ability to adopt healthy lifestyle behaviors, particularly in resource-limited settings (Bazoukis et al., 2025). Thus, while this study confirms the importance of promoting independence and adherence, it also highlights the need for holistic and multifactorial interventions to improve overall well-being in CHD patients.

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Table 3. Results of Statistical Analysis of Care Dependence and Adherence to Secondary Prevention on the Quality of Life of Patients with CHD

Variable	P Value	Correlation Coefficient
Care Dependence and Quality of Life	0,001	0,307
Adherence to secondary prevention and Quality Of Life	0,020	0,212

The results of this study indicate that there is a relationship between care dependence and adherence to secondary prevention concerning the quality of life of patients with CHD. This relationship is also moderate and positive, suggesting that care dependence and adherence to secondary prevention influence patients' physical capabilities, the frequency and stability of angina, and their perception of the disease. These three factors are dimensions of quality of life that were measured in this study.

This is consistent with the study by Huriani et al. (2022), which indicated a significant relationship between self-care and the quality of life of patients with CHD. In this study, patients with very low care dependence had a higher quality of life. Patients without care dependence showed improved self-care abilities. Research by Guo et al. (2023) indicates a strong correlation between self-efficacy and care dependence in patients with CHD, suggesting that increased self-efficacy can help reduce care dependence. Good self-care and self-management abilities are key factors in reducing the recurrence of events and the risk of sudden death (Jiang et al., 2020). Inadequate self-care can worsen patients' symptoms and contribute to hospital readmissions (Qur`Rohman, 2020). Readmission rates decrease patients' quality of life, underscoring the need to mitigate the adverse effects of disease symptoms by enhancing patients' self-care skills (Sidaria et al., 2023). Furthermore, the rate of patient readmission is closely associated with poor adherence to medication taken at home and limited self-management skills after hospital discharge (Kwok et al., 2020). For instance, Marselin et al. (2023) conducted a randomized controlled trial showing that a structured self-management intervention significantly improved both medication adherence and quality of life in CHD patients after discharge. Similarly, Aprilia et al. (2024) reported that a nurse-led self-care education program improved physical functioning and overall quality of life in outpatients with CHD.

This study is also in line with the research conducted by Ramadanti et al. (2023), which showed that respondents with CHD who effectively engaged in secondary prevention had disease severity classified as non-fatal. In this study, patients who adhered to secondary prevention exhibited a higher quality of life. This is because appropriate secondary prevention measures, such as medication, cardiac rehabilitation, and lifestyle modifications (e.g., quitting smoking, physical activity, and healthy eating), can significantly reduce the risk of recurrent cardiovascular events and mortality (Laranjo et al., 2024). The priority of secondary prevention is to implement better lifestyle changes and rehabilitation efforts following a heart attack. However, several barriers to implementing secondary prevention efforts can occur at the individual, healthcare provider, and health system levels. These include a lack of access to healthcare services and medications, as well as insufficient primary care infrastructure or environments that support healthy behaviors (De Bacquer et al., 2022) (Ponte-Negretti et al., 2021). Possible solutions include enhancing health literacy, self-management strategies, national policies to improve lifestyle and access to secondary prevention medications, implementing rehabilitation programs, and integrating digital health interventions (Beauchamp et al., 2022). Therefore, the role of healthcare professionals, particularly nurses, is crucial in carrying out these efforts. Importantly, secondary prevention interventions for CHD patients delivered by nurses should be tailored to patients' needs and available resources, ensuring optimal outcomes (Fernandez, 2023).

Quality of life is a key subjective component of a prosperous life (Angfakh et al., 2024). Several studies have also identified various factors that can affect the quality of life of patients with CHD, including anxiety, depression, and cardiac revascularization (Nuraeni et al., 2016), as well as health literacy (Lu et al., 2019). The decline in quality of life among CHD patients can exacerbate both physical and psychological conditions, necessitating a holistic approach to support patients comprehensively. Based on this study's findings, nurses can design interventions

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to improve the quality of life for CHD patients by focusing on care dependence and secondary prevention strategies.

Conclusion

There is a significant relationship between the variables of care dependence and adherence to secondary prevention concerning the quality of life of patients with CHD. The results of this study can be used by healthcare providers to design interventions to improve the quality of life for CHD patients, particularly by focusing on care dependence and adherence to secondary prevention. Therefore, future research could design interventions to enhance the quality of life of CHD patients by concentrating on care dependence and secondary prevention or by exploring other variables.

Ethics approval and consent to participate

This study has received ethical clearance from the Health Research and Development Ethics Committee (KEPPK) of RSUP Prof. dr. R. D. Kandou Manado, with approval number 096/EC/KEPK-KANDOU/V/2024, issued on May 22, 2024. Sampling and activities were conducted after respondents provided informed consent via consent forms. The benefits and risks of participating in the study, as well as the potential side effects of the interventions, were thoroughly explained by the researcher. All information and data from the study were used solely for scientific purposes. The identities of the research subjects were kept strictly confidential.

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