*Review Article*

# Towards Comprehensive Cardiovascular Care: The Part of Community-Based Rehabilitation in Controlling Cardiovascular Risk Factors in Indonesia

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## ABSTRACT

**Aim:** Alternative models of cardiac rehabilitation (CR) have emerged globally to address the underutilization of hospital-based programs. Community-based cardiac rehabilitation emphasizes patient assessment, risk stratification, education, counseling, and program evaluation. This review aims to understand the forms of community-based rehabilitation that can be implemented to enhance cardiovascular health and specifically explores their roles and applications in Indonesia.

**Methods:** A comprehensive literature search was conducted in PubMed and Google Scholar using the keywords "cardiac rehabilitation", "community-based cardiac rehabilitation", and "cardiac rehabilitation in Indonesia". We also identified relevant guidelines and textbook resources. The search was limited to articles written in English and Indonesian, and published over the past twenty years.

**Results:** Out of 644 retrieved articles, only 50 met the inclusion criteria and were used for the review.

**Conclusion:** Community-based CR is effective for patients with heart failure and acute coronary syndrome post-intervention. In Indonesia, initiatives like the chronic disease management program or *program pengendalian penyakit kronis* (Prolanis) and the integrated non-communicable disease service post or *pos pembinaan terpadu penyakit tidak menular* (Posbindu PTM) target hypertension and diabetes, key risk factors for cardiovascular diseases. However, significant disparities in awareness and treatment persist, highlighting the need for robust strategies to enhance prevention and control within community-based CR frameworks. This narrative review underscores the potential of community-based approaches to improve cardiovascular health outcomes in Indonesia and beyond.

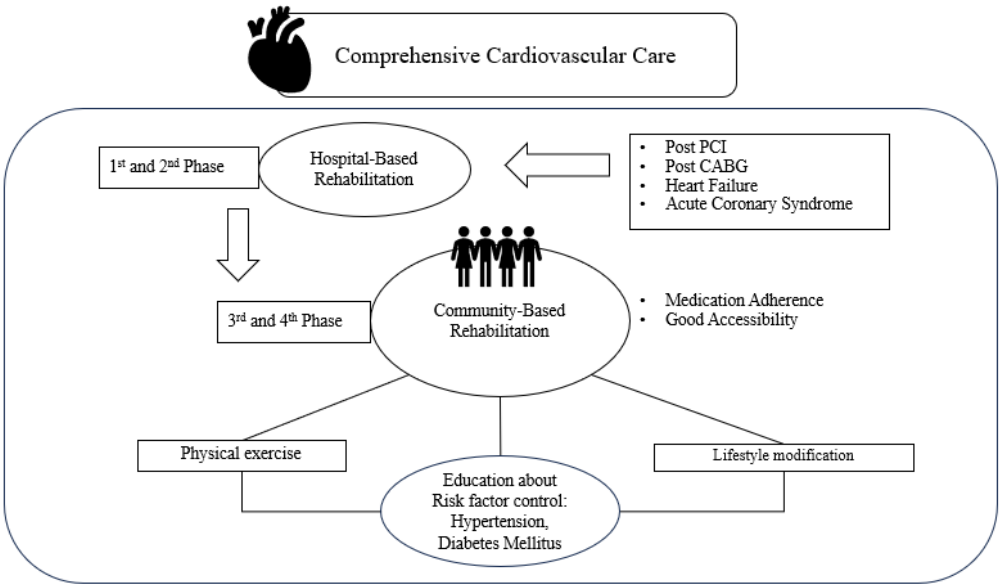
**Keywords:** Cardiovascular health, community-based cardiac rehabilitation, developing country, risk factor control

## INTRODUCTION

Since 1994, the American Heart Association (AHA) has advocated for a comprehensive approach to cardiac rehabilitation, extending beyond physical exercise programs, to address modifiable risk factors (Ardiana, 2022b). Participation in a cardiac rehabilitation program has been linked to a 26% decrease in cardiovascular disease mortality and an 18% reduction in re-hospitalization rates (Anderson et al., 2016). However, conventional hospital-based programs face under-utilization due to barriers such as geographical access, time constraints, and family obligations. To address this, alternative models like home- or community-based programs have been developed globally. Out of 111 countries with cardiac rehabilitation programs, 76.6% offer supervised programs, and 45.9% provide alternative programs, including home-based (38 countries) and community-based (25 countries) approaches (Lima de Melo Ghisi et al., 2018). Community rehabilitation, conducted in the 3rd and 4th phases of cardiac rehabilitation, involves remote monitoring via technology and supervised visits by healthcare professionals, comprising patient assessment, risk stratification, education, counseling, and program evaluation. The 3rd phase focuses on exercise programs and formal education over 3–6 months, while the 4th phase efforts can extend beyond hospitals through non-governmental organizations or community groups (B. Radi, 2009). Community-based cardiac rehabilitation has demonstrated effectiveness in improving outcomes for patients with various cardiovascular conditions, including those who have undergone percutaneous coronary intervention (PCI), coronary artery bypass grafting (CABG), heart failure, and patients recovering from acute coronary syndrome (ACS) (Tucker et al., 2016; Xiao, Li, & Guan, 2021; Zhang et al., 2024).

In Indonesia, the Ministry of Health supports rehabilitation services in both hospitals and communities, such as the integrated non-communicable disease service post or pos pembinaan terpadu penyakit tidak menular (Posbindu PTM) and chronic disease management program or program pengendalian penyakit kronis (Prolanis), which aim to control risk factors for non-communicable diseases, including cardiovascular disease. They are aimed to be part of community-based rehabilitation against cardiovascular disease, although their implementations remain challenging. Low participation rates stem from a lack of awareness and understanding of the benefits these programs offer (Ariana, Sari, & Kurniawan, 2020; Fadila & Ahmad, 2021). Additionally, barriers to adherence, such as cultural dietary habits and reliance on traditional medicine, further complicate engagement (Aungsuroch, Gunawan, Polsook, & Anuruan, 2021). Health system limitations, including inadequate resources and personnel, also hinder effective program delivery (Putri, Mawarni, Trisnantoro, & Health, 2020). Furthermore, communication and educational gaps surrounding the importance of these rehabilitation services contribute to the difficulties in running Prolanis and Posbindu PTM effectively (Ariana et al., 2020; Fadila & Ahmad, 2021). Addressing these challenges requires a concerted effort to enhance public awareness, improve healthcare infrastructure, and foster a supportive environment that encourages participation in community-based cardiac rehabilitation initiatives. In light of these needs, this review aims to provide a comprehensive understanding of community-based cardiac rehabilitation and its role in the management of cardiovascular health. The study delves into the definition, purpose, benefits, exercise options, encountered barriers, and implementation of community-based cardiac rehabilitation in the global and Indonesian context. By exploring these elements, the review seeks to identify effective strategies for overcoming existing challenges and promoting better cardiovascular health outcomes.

### TABLES AND FIGURES




## METHODS

A comprehensive literature search was conducted in PubMed and Google Scholar using the keywords "cardiac rehabilitation", "community-based cardiac rehabilitation", and "cardiac rehabilitation in Indonesia". The inclusion criteria for this study were any research method (review, experimental studies, and observational studies), limited to articles written in English and Indonesian, and published over the past twenty years. We also identified relevant literature, such as study protocols, reviews, policy papers, report, book chapters, and non-peer-reviewed documents.

## RESULTS

Out of 644 retrieved articles, only 50 met the inclusion criteria and were used for the review. An integrative review was conducted in reviewing all evidence related to the community-based cardiac rehabilitation, with a focus on its application in Indonesia. The collected data is subsequently organized based on the relevant topics and discussions of the identified issues. This includes a global overview of community-based cardiac rehabilitation, its application to specific cardiovascular diseases, and an analysis of its implementation in Indonesia, with particular attention to its potential for further development.

## DISCUSSION

Cardiac rehabilitation, centered on physical exercise, aims to enhance or maintain various aspects of physical fitness. Individuals, including those with cardiovascular disease, are encouraged to engage in increased physical or aerobic exercise to improve their cardio-respiratory fitness (Ardiana, 2022b). The measurement of physical exercise in cardiac rehabilitation encompasses cardio-respiratory fitness, strength, and muscle flexibility (Medicine, 2018). Specifically, aerobic exercises, characterized by rhythmic movements involving large muscle groups, yield positive effects on the heart, blood vessels, muscle fitness, and strength (Ardiana, 2022b).

### Cardiac Rehabilitation Phase

The comprehensive approach to cardiac rehabilitation aims to optimize cardiovascular health through targeted physical exercise interventions. Cardiac rehabilitation initiates once the patient's hemodynamics stabilize and there have been no occurrences of chest

pain or changes in electrocardiography (EKG) pattern for the preceding 8 hours. The rehabilitation process, organized based on time and purpose, comprises four distinct phases: the first phase (inpatient rehabilitation), the second phase (outpatient rehabilitation), the third phase (maintenance program), and the fourth phase (lifelong maintenance) (Ardiana, 2022a). While some literatures outline a three-phase division of cardiac rehabilitation, this review specifically focuses on the four-phase model (Makita et al., 2022). The third phase, or maintaining phase, aims to maintain the achieved conditions in first and second phase, prevent recurrent attacks, promote disease stability, and facilitate a return to work (Makita et al., 2022; Trust, 2011). The fourth phase constitutes a lifelong maintenance phase with overall monitoring by the primary healthcare team on a weekly basis. In this phase, patients can engage in independent exercises at home or join healthy heart clubs. The exercise program is tailored to individual capabilities, and cessation is advised if patients experience chest pain, shortness of breath, nausea, vomiting, severe arrhythmia, cold sweats, or excessive fatigue (Trust, 2011).

## Community-based Cardiac Rehabilitation: Participation and Implementation

### *Cardiac Rehabilitation: Home-Based and Community-Based Approaches*

Cardiac rehabilitation has proven health benefits and is recommended for patients with cardiovascular diseases. However, patients often face multilevel barriers, such as accessibility, geographical location, and distance to hospitals, when participating in hospital-based cardiac rehabilitation programs. To address these challenges, alternative forms of cardiac rehabilitation programs have been developed, including home-based cardiac rehabilitation (HBCR) and community-based cardiac rehabilitation (CBCR) (Nagatomi et al., 2022).

In home-based rehabilitation, patients undergo an initial assessment at a cardiac rehabilitation center, where their safety for independent exercise is evaluated and a tailored exercise prescription is developed. Exercises are performed without formal supervision, and regular contact through phone or other technologies is established to review the exercises. In community-based rehabilitation, local exercise facilities are utilized, and cardiac rehabilitation staff visit these centers to provide comprehensive services. Alternative models consist of home-based rehabilitation (utilizing information and communication technologies), community-based programs, and hybrid programs (Lima de Melo Ghisi et al., 2018).

The overarching goal of community-based rehabilitation programs is to promote and support long-term adherence to exercise and healthy lifestyle behaviors. Maintenance is structured, with exercise programs tailored to individual conditions and accessibility needs, covering cardiac, behavioral, and psychological aspects (S. Mandic, 2018). Continuation programs, or the third phase of cardiac rehabilitation, can take various forms, ranging from services similar to hospital-based outpatient clinics to clubs or associations managed and run by patients themselves. These programs go beyond providing physical exercise; they also offer health education on nutrition and psychological counseling. Their vital role in the recovery and maintenance of functional capacity and psychological health for patients with cardiovascular diseases is significant. Success is achieved when these programs are grounded in strong scientific principles while maintaining sensitivity to the social and cultural context of individuals and communities (S. Mandic, 2018).

### *Cardiac Rehabilitation: Community-Based Approach and Maintenance Phase*

To date, there is no universal agreement on the definition of community-based cardiac rehabilitation. However, in their implementation, guidelines for community-based cardiac rehabilitation typically incorporate the core components of cardiac rehabilitation, which include structured exercise, patient education, and counseling. Programs are

implemented in shared facilities, with the cardiac rehabilitation team visiting these facilities to deliver comprehensive services (Lima de Melo Ghisi et al., 2018).

In the maintenance phase, the emphasis of exercise programs is on aerobic exercises. For patients with a functional capacity above 5 METs, exercise programs are designed based on heart rate and Rating of Perceived Exertion (RPE). The recommended exercise frequency is 3–4 times a week, starting with a duration of 10 minutes and gradually increasing to 60 minutes. Various methods can be employed, including interval training, circuit training, circuit-interval training, and continuous training (Arovah, 2010).

## Community-based Cardiac Rehabilitation in Disease Groups

### *Post-PCI Cardiac Rehabilitation: Community-Based Approach*

Post-percutaneous coronary intervention (PCI) cardiac rehabilitation has been proven instrumental in reducing mortality rates, alleviating patient symptoms, enhancing functional capacity, improving Quality of Life (QoL), promoting early return to work, and enhancing self control among patients (Xiao et al., 2021). According to a meta-analysis conducted by Yang et al. (2017), cardiac rehabilitation has been shown to reduce angina recurrence, improve ST-segment patterns, as well as increase total exercise time and maximum exercise tolerance in post-PCI patients. In a study by Xiao et al. (2021), community-based cardiac rehabilitation in post-PCI acute myocardial infarction patients was found to reduce the risk of major adverse cardiac events (MACE), improve heart function, and enhance physical stamina. However, most hospital-based cardiac rehabilitation programs face time limitations with short-duration programs (less than 3 months). Hence, community-based rehabilitation becomes crucial in sustaining the benefits acquired from prior hospital rehabilitation.

### *Post-Coronary Artery Bypass Graft (CABG) Rehabilitation*

The target parameters for post-CABG patients who have completed phase II rehabilitation are evaluated based on several components: 1. Functional Capacity: Recommended to achieve 5–6 METs. 2. Health Status: a) Normal hemodynamic response during exercise (normal blood pressure, EKG, no arrhythmia); b) Absence of angina or stable angina pectoris; c) Resting heart rate <90 beats per minute; stable and controlled blood pressure at rest (<140/90 mmHg); 3. Relevant Physical Activity: Relevant to daily activities, working with a capacity of 5–6 METs. 4. Education: Patients should be able to comprehend: a) The definition of cardiovascular disease; b) Cardiac rehabilitation program; c) Healthy lifestyle for coronary heart disease risk factor modification; d) Reasons for therapy; e) Activity limitations, including sexual, vocational, and recreational activities; f) Personalized exercise based on prescription and recognizing warning signs; g) Signs and symptoms of exercise intolerance due to fatigue. Patients meeting these parameters enter phases III–IV of 3-6 months cardiac rehabilitation, with a target functional capacity of 6–8 METs (Ong et al., 2016). The American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) and the American College of Sports Medicine (ACSM) recommend community-based programs only for low-risk patients, providing both aerobic and resistance exercises (Arovah, 2010).

### *Heart Failure Rehabilitation*

Heart failure results in persistent morbidity and mortality, despite significant improvements in treatment (Ponikowski et al., 2016). Exercise intolerance is one contributing factor to the decreased quality of life in heart failure patients, marked by fatigue and dyspnea even with low workloads. The degree of exercise limitations is not only associated with the level of heart dysfunction but involves non-cardiac factors such as peripheral disorders (vasoreactivity, disorder of the skeletal muscle energy metabolism, and functional iron deficiency) (Conraads et al., 2013). Exercise in heart failure patients has been

proven to increase peak oxygen consumption (peak VO2), with minor changes in peak VO2 are associated with significant improvements in patient outcomes (Xiao et al., 2021).

Exercise is expected to improve both central and peripheral disturbances and is clinically linked to increased quality of life, exercise capacity, and clinical improvement in patients with heart failure (Tucker et al., 2016). Exercise in patients with heart failure is recommended based on an individualized approach. Training protocols vary in method (continuous and interval), intensity (aerobic and anaerobic), and type (endurance and resistance). Continuous endurance exercise is considered the most effective and safe form of exercise, marked by steady-state aerobic conditions with moderate-to-high exercise intensity, allowing patients to engage in long exercise sessions (45–60 minutes) using a bike or treadmill (Stoylen et al., 2012). After completing exercise in a structured and supervised centralized program for 8–12 weeks, a gradual shift to a home-based program can stimulate patients to adhere to exercise and remain active for a longer period (Ardiana, 2022a). To enhance long-term exercise compliance, patient preferences for specific types of exercise should be considered. During this period, self-care management plays a crucial role in successfully achieving improvements in symptoms of heart failure, functional capacity, morbidity, prognosis, and quality of life (Ardiana, 2022b). Self-care management aims to maintain physical stability, avoid behaviors that worsen conditions, and detect early signs of worsening heart failure, including medication adherence, weight monitoring, physical exercise, and fluid intake (PERKI, 2015; Johansson, van der Wal, Stromberg, Waldreus, & Jaarsma, 2016).

High-intensity exercise is not recommended for heart failure patients. Exercise can start with low intensity, around 30% of maximum muscle strength (Piepoli et al., 2011). Studies have reported that low-intensity exercise can be balanced by increasing exercise frequency (Csapo & Alegre, 2016).

### *Rehabilitation after Acute Coronary Syndrome*

A randomized clinical trial conducted by Bertelsen et al. (2013) aimed to explore the accessibility and benefits of community-based cardiac rehabilitation for patients with acute coronary syndrome. The study concluded that patient participation in post-hospitalization advanced rehabilitation programs is strongly influenced by social factors, with the patient's family playing a significant role. The long-term advantages of cardiac rehabilitation programs participation were highlighted in an Australian study with a 14-year follow-up of 281 patients. Patients with less than 25% participation had twice the mortality rate compared to those participating in more than 75% of the program (Beauchamp et al., 2013).

## Evaluation and Monitoring in Community-based Cardiac Rehabilitation

Numerous studies have been conducted to assess the benefits of cardiac rehabilitation, focusing on outcomes related to quality of life, reduced mortality, and hospital admissions (Dalal, Doherty, & Taylor, 2015; Goel, Lennon, Tilbury, Squires, & Thomas, 2011). Additionally, clinical parameters such as blood pressure, total cholesterol (TC), low-density lipoprotein cholesterol (LDL), and triglycerides (TG) have also been employed (Dalal et al., 2015; Kubilius et al., 2012; Richardson et al., 2008). Ong et al. (2016) conducted a cohort study to evaluate outcomes following a community-based cardiac rehabilitation program. At the 1-year follow-up, the evaluation revealed statistically significant improvements, including improvement in all lipid profile parameters, fasting blood sugar levels, systolic and diastolic blood pressure, increase in 6MWD, and maximum heart rate during 6MWT.

Understanding community-based cardiac rehabilitation as an integral component of comprehensive cardiovascular care, it is essential to develop and implement strategies that incorporate the core component of cardiac rehabilitation. These strategies should be

tailored to the specific needs and context of the Indonesian population, ensuring that they complement existing cardiovascular care efforts and enhance patient outcomes through multidisciplinary and comprehensive approaches.

### Development of Community-based Cardiac Rehabilitation in Indonesia

While the theoretical framework of community-based cardiac rehabilitation emphasizes a multifaceted approach encompassing exercise programs, lifestyle modifications, psychosocial support, and long-term follow-up, the practical implementation in Indonesia takes on a different form, while still aligning with the core principles of the ideal framework. This is crucial in addressing the growing burden of cardiovascular disease in Indonesia, which can be effectively tackled through community-based interventions that prioritize risk factor screening, precise risk stratification, and aggressive guideline-directed treatment (Waranugraha, 2022). Various stakeholders within the community structure play a pivotal role in the implementation of community-based rehabilitation. This includes policymakers who serve as decision-makers, health professionals who lead clinical interventions, and community leaders who collaborate with specially trained cadres. These cadres, often consisting of trained volunteers or community health workers, are responsible for executing preventive rehabilitation initiatives at the local level, ensuring that services are accessible to the needs of the community.

Recent studies have demonstrated the efficacy of community-based cardiac rehabilitation in Indonesia, highlighting its benefits in medication adherence, improving quality of life, and reducing rehospitalization rates among patients with stable coronary artery disease (Karimullah, Rohman, Adriyanto, Tjahjono, & Widito, 2020). Community-based programs typically include educational sessions on disease management, medication adherence, and understanding of drug side effects. By enhancing individuals' understanding and confidence in managing their conditions, these programs improve health literacy, which is directly correlated with more optimal disease management, greater self-care involvement, and better clinical outcomes (Tan, Cheng, & Siah, 2019). Additionally, cardiac rehabilitation also significantly enhances health behaviors among participants, encouraging them to adopt healthier lifestyle choices that are crucial for effective cardiac rehabilitation (Herliani, Matchim, & Kritpracha, 2016). Community-based programs have been shown to decrease systolic and diastolic blood pressure, as well as fasting blood glucose levels, which are critical in managing cardiovascular risk factors (Soltani et al., 2021). Furthermore, community-based interventions have demonstrated improvements in blood glucose levels and physical fitness, such as increased 6-minute walk distance, which are essential for successful rehabilitation (Baek et al., 2020). The services are often integrated within primary healthcare settings, which may not fully align with the specialized focus on ideal cardiac rehabilitation but it can enhance accessibility (Nugraha et al., 2021). Indonesia's community-based cardiac rehabilitation initiatives can play a pivotal role in managing cardiovascular risk factors, particularly in integrating post-cardiac event rehabilitation and long-term cardiac care. The role of community-based cardiac rehabilitation in Indonesia is schematically summarized in figure 1.

In 2015, hypertension was the primary risk factor for cardiovascular disease and accounted for 41% of all disability-adjusted life-years lost (Disease, Injury, & Prevalence, 2017). The prevalence of hypertension in Indonesia in 2014, adjusted for age, stood at 30.2% (Sujarwoto & Maharani, 2020). The persistence of hypertension is notable in low- and middle-income countries (LMICs). Analysis also indicates that 41.8% of those with hypertension were aware of their condition, with a higher percentage observed in urban settings (42.4%) compared to rural areas (41.4%). Treatment for hypertension was received by only 5.9% of individuals residing in rural areas, a slightly higher proportion than the 7.3% observed in urban areas. These findings highlight the enduring disparities in hypertension care between urban and rural areas, despite governmental initiatives aimed at

improving healthcare accessibility, such as universal health coverage in early 2014, through Jaminan Kesehatan Nasional (JKN) (Sujarwoto & Maharani, 2020).

The Indonesian government launched Prolanis (Program Pengendalian Penyakit Kronis) in 2010 with the goal of managing chronic diseases, specifically diabetes and hypertension. Following the introduction of universal health coverage (UHC) in 2014, the program is still in place (Khoe, Wangge, Soewondo, Tahapary, & Widyahening, 2020). By signing up for this program, patients with chronic illnesses can get the following benefits: 1) health education and medical advice; 2) routine health status monitoring; 3) home visit; 4) SMS gateway-based smartphone reminders; 5) club activities; and 6) regular monthly medication administration (BPJS, 2012). The number of Prolanis participants increased from 11,000 in 2014 to 250,000 in 2016, with 70% of them being adults residing in Java. Among the various activities in Prolanis, physical activity recorded the highest participation (GBD, 2017). This element is recognized as one of the core components of cardiac rehabilitation. However, the current physical activity protocols necessitate adjustments to align with established recommendations for cardiac rehabilitation. Specifically, it is essential to focus on aerobic exercise with appropriate frequency, intensity, and duration to optimize its effectiveness in enhancing cardiovascular health.

In addition to the Prolanis program, the Indonesian government also implements the integrated non-communicable disease service post (Posbindu PTM) as one of the strategies to control non-communicable diseases (NCDs) such as heart disease, diabetes mellitus (DM), chronic obstructive pulmonary disease (COPD), cancer, and illness brought by violence and accidents. Targeting anybody above the age of 15, especially those of productive age, the program is a community-based initiative managed by community health cadres (volunteers) under the direction of primary healthcare center (PHC) authorities. Its goal is to empower communities to screen for non-communicable diseases (NCDs) and associated risk factors (Kemenkes, 2012; Moeloek, 2017). It also represents community participation in integrated, regular, and periodic monitoring of the primary NCD risk factors and early detection initiatives. The activities are integrated into existing community-based health efforts, either in the workplace, company clinics, educational institutions, or other places where communities gather or engage in regular activities. The activities include 10 aspects, such as blood sugar examination, total cholesterol and triglyceride assessment, counseling and education, and communal physical activity or sports, among others (BPJS, 2012).

These multi-faceted chronic disease management strategies combine pharmacological and non-pharmacological strategies (e.g., education, physical activity, reminder system, and monitoring) in their interventions. Primary healthcare facilities already run the program in association with the national health insurance agency. Primary care clinics, private offices, and community health centers (Puskesmas) comprise the primary healthcare centers (Disease et al., 2017). A study conducted by Widyaningsih et al. (2022) on primary healthcare centers (PHC) in 3 provinces and 7 districts in Indonesia found that 80% of the visitors to Posbindu for hypertension screening and risk factor assessment were women, and 50% of them were adults aged 50 years and older. Out of the 95.1% of patients who visited and had their blood pressure checked, 35.3% showed an increase in blood pressure. Additionally, less than 80% of patients underwent anthropometric measurements, less than 25% were interviewed about NCD risk factors, and less than 15% had their blood cholesterol checked. The main obstacles in implementing effective hypertension screening identified in the study included insufficient resources and time for conducting these examinations. The data also revealed that, on average, patients visited Posbindu about 12 times in 2 years (Widyaningsih et al., 2022).

A study conducted by Sujarwoto et al. (2020) provided substantial evidence regarding the positive effect of Community-Based Health Interventions (CBHI) towards

healthcare and health outcomes. While earlier study has frequently emphasized the advantages of CBHIs in family planning, nutrition access, and the prevention of communicable diseases, their study clearly shows a link between increased awareness, treatment, and management of hypertension and CBHI involvement for NCDs (Ekman, 2004; Fauveau, Stewart, Khan, & Chakraborty, 1991; Yip et al., 2007). Furthermore, the study indicates that engagement in CBHIs for NCDs was associated with increased treatment and awareness among respondents who have hypertension, but not with blood pressure management. For policymakers, these findings underline the importance of implementing additional services and strategies to improve hypertension prevention and control. This could involve the introduction of health education initiatives along with other preventive approaches to managing hypertension as one of the primary risk factors for cardiovascular disease.

The implementation of community-based cardiac rehabilitation in Indonesia, while distinct in its approach, effectively aligns with the core principles of the ideal model. Through innovative strategies such as home-based rehabilitation and integration within primary healthcare, these programs enhance accessibility and empower patients to manage their health more effectively. Government initiatives like Prolanis and Posbindu PTM further support these efforts by providing comprehensive chronic disease management and promoting health education within communities. The positive outcomes observed in medication adherence, quality of life, and cardiovascular risk factor management underscore the potential of these initiatives to address the growing burden of cardiovascular diseases in Indonesia. Continued investment in community-based strategies is essential for improving health outcomes and ensuring sustainable care for patients with chronic conditions, particularly in low- and middle-income settings.

## CONCLUSIONS

Community-based cardiac rehabilitation has emerged as a viable alternative to hospital-based programs, addressing challenges like accessibility and geographical constraints. Despite the recognized effectiveness of cardiac rehabilitation in reducing cardiovascular disease mortality and morbidity, patients often encounter barriers that hinder their participation in hospital-based programs. In response to this, community-based initiatives aim to enhance involvement in cardiac rehabilitation, particularly during the maintenance phase throughout individuals' lives. Promoting and maintaining long-term adherence to physical activity and good living practices is given top priority in the programs. Global findings indicate that 54.7% of all nations implement cardiac rehabilitation programs, with 76.6% incorporating supervised rehabilitation. In Indonesia, both governmental and non-governmental programs have been implemented to support community-based cardiac rehabilitation in terms of risk factor control, especially hypertension and diabetes mellitus. They are run by the community, with cadres spearheading the implementation of the program and the health workers at primary healthcare centers as supervisors. Further studies are needed to evaluate the effectiveness and development path of the program to align with the overarching goal of supporting a lasting commitment to a heart-healthy lifestyle.

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