

Review article

Cardiac Rehabilitation Programs and Health-Related Quality of Life. State of the Art

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Article history:

Available online 19 October 2011

Keywords:

Health-related quality of life
Cardiovascular diseases
Physical exercise programs
Cardiac rehabilitation

Palabras clave:

Calidad de vida relacionada con la salud
Enfermedad cardiovascular
Programas de ejercicio físico
Rehabilitación cardiaca

ABSTRACT

Cardiovascular disease is the main health problem in developed countries. Prevention is presented as the most effective and efficient primary care intervention, whereas cardiac rehabilitation programs are considered the most effective of secondary prevention interventions; however, these are underused. This literature review examines the effectiveness and the levels of evidence of cardiac rehabilitation programs, their components, their development and role in developed countries, applications in different fields of research and treatment, including their psychological aspects, and their application in heart failure as a paradigm of disease care under this type of intervention. It is completed by a review of the impact of such programs on measures of health-related quality of life, describing the instruments involved in studies in recent scientific literature.

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Programas de rehabilitación cardiaca y calidad de vida relacionada con la salud. Situación actual

RESUMEN

Las enfermedades cardiovasculares constituyen el principal problema de salud en los países desarrollados. La prevención se presenta como la herramienta más eficaz y eficiente, mientras que los programas de rehabilitación cardiaca son considerados como los más eficaces entre las intervenciones de prevención secundaria; sin embargo estos están infrautilizados. La presente revisión de la literatura aborda la efectividad y los niveles de evidencia de los programas de rehabilitación cardiaca, sus componentes, el papel desempeñado y la evolución en los países desarrollados, las aplicaciones descritas en diferentes campos de investigación y tratamiento, aspectos psicológicos considerados en ellos, así como su aplicación en la insuficiencia cardiaca como enfermedad paradigma de atención en este tipo de intervención. Se completa con una revisión sobre el impacto de dichos programas en las medidas de calidad de vida relacionada con la salud y se describen los instrumentos implicados en los principales estudios científicos de la literatura científica reciente.

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INTRODUCTION AND CONCEPTS

Cardiovascular disease (CVD) is the major health problem in developed countries. According to the World Health Organization (WHO), approximately 17 million people die annually from CVD.¹ In 2005, heart disease was the leading cause of mortality in western countries.² Longevity and advances in treatment have led to an increase in the prevalence of heart disease. Its prognosis has improved due to prevention, treatment and rehabilitation programs. However, as a result of these interventions, morbidity has increased due to disease progression. Prevention appears to be the

most effective and efficient approach to managing CVD, whereas cardiac rehabilitation programs (CRPs) are the most effective for secondary prevention.³

The aims of prevention are to reduce morbidity and mortality in patients at high absolute risk and to help those at low risk to remain in this category, thereby maintaining the health of the population.⁴ CRPs were developed in the 1960s as recommended by the WHO to improve health-related quality of life (HRQOL) and the prognosis of patients with heart disease.⁴ These programs were defined as the set of therapeutic measures for the comprehensive care of patients with CVD, and are particularly useful and effective in patients with coronary disease and chronic heart failure (CHF).⁵

Any CRP should include specific components to optimize the reduction of cardiovascular risk and promote healthy behavior and

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Abbreviations

CHF: chronic heart failure
 CR: cardiac rehabilitation
 CRP: cardiac rehabilitation program
 CVD: cardiovascular diseases
 ET: exercise training
 HF: heart failure
 HRQOL: health-related quality of life
 MLHFQ: Minnesota Living with Heart Failure Questionnaire

compliance by using educational programs that foster the active participation of patients in their own treatment and encourage CVD patients to have an active lifestyle, thereby reducing disability.⁶

To be optimally effective, CRPs should be based on a multi-disciplinary approach and include exercise training (ET) and psychological counseling. In patients with coronary disease CRP should also include the control of risk factors.^{5,7-9}

Different societies and associations have recommended that both those working with cardiac rehabilitation (CR) groups and the training programs themselves should comply with professional standards. Guidelines recommend the development of programs that make access to CRPs easier and faster, in the sense that they should be automatically prescribed. The latest European Guidelines on Cardiovascular Disease Prevention in Clinical Practice¹⁰ recommend the increased involvement of physicians and primary health care professionals since they have more opportunity to significantly improve the prevention and treatment of CVD.

There is clear and sufficient evidence (class I) that CRPs significantly improve HRQOL, leading to a decrease in complications and mortality of around 40% in patients at low risk.⁴ Moreover, the risks of exercise (including sudden death) are considered acceptable because of its benefit to patients.⁴ Other authors⁷ suggest that the cost-effectiveness and cost-benefit ratio of CRPs are currently the best treatment or intervention in heart disease compared to any other. These authors also suggest the creation of follow-up and monitoring units due to the fact that the benefits of CRP decrease over time.

BENEFIT AND USE OF CARDIAC REHABILITATION PROGRAMS IN THE DEVELOPED WORLD

Despite these recommendations and results, CRPs are rarely implemented.³ In Spain, only 2% to 3% of the population with indications access CRP.^{4,11,12} According to the European Cardiac Rehabilitation Inventory Survey (2008),¹³ Spain is the European country with the fewest CR centers and with the lowest CR activity. In 2003, only 12 National Health Service hospitals offered CR, most of which were tertiary hospitals in Madrid, Catalonia, and Andalusia.¹¹ There are many reasons for this, the chief of which is that the majority of CVD patients are discharged from hospital without CRP being recommended.

A set of measures has been established to improve compliance with the recommendations regarding CRP. These measures refer to patient selection and inclusion, the structure and operation of the program, and compliance with its objectives. In countries such as the USA, where less than 30% of patients with indications participate in CRPs,⁵ nonobligatory CRP accreditation systems exist. In fact, only 37% of the CR units are accredited by the American Association of Cardiovascular and Pulmonary Rehabilitation. This association has proposed measures to standardize

patient referral to CR and to ensure that the CRP unit has a good infrastructure which functions optimally.

In 2009, Brown et al.¹⁴ presented the results of a study that identified the predictors of CR referral in patients with coronary disease. This study analyzed 72 817 patients discharged from 156 hospitals between 2000 and 2007 after myocardial infarction or percutaneous or surgical coronary revascularization. Only 56% of patients were referred to CR. The authors conclude that the probability of referral to a CR is lower if the patient is older, has non-ST-segment elevation myocardial infarction, or there are comorbidities. They recommend raising medical awareness on the benefits of CR, overcoming barriers related to treatment costs, reducing the time patients need to invest in the program, and shortening travel times to the CRP unit.

The third study conducted by the European Action on Primary and Secondary Prevention by Intervention to Reduce Events (EUROASPIRE III) study group¹⁵ was designed to determine whether the European guidelines on cardiovascular prevention in patients with coronary disease were being followed in everyday clinical practice in Europe in relation to risk factor and therapeutic management and to describe the patients' lifestyle. This study was conducted between 2006 and 2007 in 76 centers in 22 European countries; patients with a clinical diagnosis of coronary disease were retrospectively identified. A total of 8966 patients were interviewed. A high percentage of these patients did not achieve the lifestyle or therapeutic targets for CVD prevention (17% smoked, 35% were obese, 56% had high blood pressure, and 51% had dyslipidemia) and only one-third of patients had access to any form of CR. A study published in *The Lancet*¹⁶ compared the results of the EUROASPIRE III study to those obtained by EUROASPIRE I and II (1995¹⁷ and 2000,¹⁸ respectively) and showed that after 12 years, the aims of secondary prevention of coronary disease had still not been achieved in Europe. It is essential that patients understand the nature of their disease and the best way to manage it, and this can be achieved through a comprehensive program of prevention and rehabilitation that should be offered automatically.

Traditionally, CR has been indicated for patients after infarction or revascularization. Currently, with the exception of patients with dissecting aortic aneurysm and severe left ventricular outflow tract obstruction, all patients with heart disease may benefit from CR, particularly those who are older or who have severe disease.⁷ This includes patients with heart failure (HF),¹⁹ pacemakers, or implantable cardioverter-defibrillators. In the latter two groups, rehabilitation is indicated not because of the implanted device but because of the underlying disease, since these patients normally have poor ventricular function.¹²

PHYSICAL ACTIVITY IN CARDIAC REHABILITATION PROGRAMS

In a recent review article, Grima et al.¹² reported that secondary prevention delivered as ET-based CR was the intervention strategy with the greatest amount of scientific evidence in support of its reducing morbidity and mortality in coronary disease, particularly after myocardial infarction. The European Society of Cardiology, the American Heart Association, and the American College of Cardiology classify such evidence as class I. There is also class I evidence for other types of cardiac intervention and stable CHF.

Several studies^{20,21} have shown a correlation between physical activity, and particularly physical fitness, in children and adolescents and a lower prevalence of isolated or combined cardiovascular risk factors (blood pressure and blood lipid concentration). The American Heart Association and American College of Sports Medicine guidelines have described the amount and type of physical activity to be performed by older individuals.²² They recommended

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