Chapter 1

CARDIAC TELEREHABILITATION

A. KOSTANOĞLU¹ A. S. MANZAK²

INTRODUCTION

Telerehabilitation is defined as remotely given rehabilitation services through telecommunication technologies, comprising the phone, the internet, and vide-oconference transmissions between the patient and healthcare professionals (1). The conceptional structure of telerehabilitation composes of the three domains affecting the results of telerehabilitation approaches. These are rehabilitation related bio-systems, human-technology interfaces, and behavioral adaptations. Each constituent of such structure can be utilize to conceptualize, understand the entire process and analyze alternative approaches for optimizing results (2). Systems can range from inexpensive video phones to costly virtual reality systems with tactile interfaces (3).

BASIC PARTS OF CARDIAC TELEREHABILITATION SYSTEMS:

1. Image-Based Telerehabilitation (Telecoaching): Using video conferences and visual assessments within the process of distance counseling and rehabilitation sessions (4). Also, web applications can be used as telecoaching systems. These systems allow registration and adjustment of rehabilitation objective, training goals, and treatment modules, uploading and reviewing the exercise session performance and level of physical activity, perform of a video consultation with physical therapists and permit caregivers and relevant health care providers to have access to the available data (5,6).

Assist. Prof. Alis Kostanoğlu, PT, PhD, Bezmialem Vakıf University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, aliskostanoglu@yahoo.com

² Research Assist. Ayşe Sena Manzak, PT, Bezmialem Vakıf University, Institute of Health Sciences, senamanzak@hotmail.com

Health Sciences II

Keywords: cardiac, rehabilitation, telerehabilitation

REFERENCES

- 1. Frederix I, Solmi F, Piepoli MF, et.al. Cardiac telerehabilitation: A novel cost-efficient care delivery strategy that can induce long-term health benefits. European journal of preventive cardiology, 2017;24(16), 1708-1717.
- 2. Winters JM, Winters JM. A telehomecare model for optimizing rehabilitation outcomes. Telemed J E Health. 2004; 10(2): 200-212. doi: 10.1089/tmj.2004.10.200
- 3. Theodoros D, Russell T. Telerehabilitation: current perspectives. Stud Health Technol Inform. 2008; 131: 191-209.
- 4. Mikołajewska E, Mikołajewska D. Cardiac Telerehabilitation-Current State and Clinical Perspectives. Heart Res Open J. 2014; 1(1), 10-14.
- 5. Frederix I, Vanhees L, Dendale P, et al. A review of tele- rehabilitation for cardiac patients. J Telemed Telecare 2015; 21: 45–53.
- Frederix, I, Hansen D, Coninx K, et.al. Medium-term effectiveness of a comprehensive internet-based and patient-specific telerehabilitation program with text messaging support for cardiac patients: randomized controlled trial. Journal of medical Internet research, 2015; 17(7).
- 7. Smart N, Haluska B, Jeffriess L, et al. Predictors of sustained response to exercise training in patients with chronic heart failure: A telemonitoring study. Am Heart J. 2005; 150: 1240–1247.
- 8. Kouidi E, Farmakiotis A, Kouidis N, et al. Transtelephonic electrocardiographic monitoring of an outpatient cardiac rehabilitation programme. Clin Rehabil. 2006; 20: 1100–1104.
- 9. Piotrowicz E, Baranowski R, Bilinska M, et al. A new model of home-based telemonitored cardiac rehabilitation in patients with heart failure: Effectiveness, quality of life and adherence. Eur J Heart Fail. 2010; 12: 164–171.
- Squires RW, Miller TD, Harn T, et al. Transtelephonic electrocardiographic monitoring of cardiac rehabilitation exercise sessions in coronary artery disease. Am J Cardiol. 1991; 67: 962– 964.
- 11. Piotrowicz E, Piotrowski W, Piotrowicz R. Positive effects of the reversion of depression on the sympathovagal balance after telerehabilitation in heart failure patients. Annals of Noninvasive Electrocardiology, 2016; 21(4), 358-368.
- 12. Bernocchi P, Vitacca M, La Rovere MT, et.al. Home-based telerehabilitation in older patients with chronic obstructive pulmonary disease and heart failure: a randomised controlled trial. Age and ageing, 2017; 47(1), 82-88.
- 13. Hwang R, Bruning J, Morris NR, et.al. Home-based telerehabilitation is not inferior to a centre-based program in patients with chronic heart failure: a randomised trial. Journal of physiotherapy, 2017;63(2), 101-107.
- 14. Hedback B, Perk J, Hornblad M, et.al. Cardiac rehabilitation after coronary artery bypass surgery: 10-year results on mortality, morbidity and readmissions to hospital. J Cardiovasc Risk. 2001; 8: 153–158.
- 15. Taylor RS, Brown A, Ebrahim S et al. Exercise-based rehabilitation for patients with coronary heart disease: systematic review and meta-analysis of randomized controlled trials. Am J Med. 2004; 116: 682–692.
- 16. Leon AS, Franklin BA, Costa F et al. Cardiac rehabilitation and secondary prevention of coronary heart disease: an American Heart Association scientific statement from the Council on Clini- cal Cardiology and the Council on Nutrition, Physical Activity, and Metabolism, in collaboration with the American association of Cardiovascular and Pulmonary Rehabilitation. Circulation, 2005; 111: 369–376.
- 17. Clark AM, Hartling L, Vandermeer B, et al. Meta-analysis: secondary prevention programs for patients with coronary artery disease. Ann Intern Med. 2005; 143:659–72.
- 18. Korzeniowska-Kubacka I, Bilińska M, Dobraszkiewicz-Wasilewska B, et al. Hybrid model of cardiac rehabilitation in men and women after myocardial infarction. Cardiology journal,

Health Sciences II

- 2015; 22(2), 212-218.
- 19. Korzeniowska-Kubacka I, Bilińska M, Dobraszkiewicz-Wasilewska B, et.al. Comparison between hybrid and standard centre-based cardiac rehabilitation in female patients after myocardial infarction: a pilot study. Kardiologia Polska (Polish Heart Journal), 2014; 72(3), 269-274.
- 20. Varnfield, M, Karunanithi M, Lee C, et.al. Smartphone-based home care model improved use of cardiac rehabilitation in postmyocardial infarction patients: results from a randomised controlled trial. Heart, 2014; 100(22), 1770-1779.
- 21. European Heart Network (2015). Fighting Heart Disease and Stroke, Scharf P, 2015. About us URL: http://www.ehnheart.org/about-us/overview.html [accessed 2015-05-31] [WebCite Cache ID 6YwSAyrVl]
- 22. Szalewska D, Zieliński P, Tomaszewski J, et al. Effects of outpatient followed by home-based telemonitored cardiac rehabilitation in patients with coronary artery disease. Kardiologia Polska (Polish Heart Journal), 2015; 73(11), 1101-1107.
- 23. Frederix I, Hansen D, Coninx K, et.al. Effect of comprehensive cardiac telerehabilitation on one-year cardiovascular rehospitalization rate, medical costs and quality of life: A cost-effectiveness analysis. European journal of preventive cardiology, 2016; 23(7), 674-682.
- 24. Vieira Á, Melo C, Machado J, et.al. Virtual reality exercise on a home-based phase III cardiac rehabilitation program, effect on executive function, quality of life and depression, anxiety and stress: a randomized controlled trial. Disability and Rehabilitation: Assistive Technology, 2018; 13(2), 112-123.