

Implementation of the TeleCordis project from the National Recovery and Resilience Plan: Increasing the efficiency and availability of telemedicine services

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Abstract. *The National Recovery and Resilience Plan (NRRP) in the Republic of Croatia also launched an initiative to improve telemedicine services. One of the key healthcare digitization projects within NRRP is TeleCordis, which focuses on improving telemedicine services for patients with cardiovascular diseases. One of the main achievements of the TeleCordis project is the procurement and installation of medical and computer equipment in 40 locations of health centers in remote and rural areas and in four specialist telemedicine centers.*

The project is based on the application of telemedicine technologies in the field of cardiology to enable the provision of specialist cardiology care remotely.

Keywords. NRRP, TeleCordis, telemedicine

1 Introduction

The World Health Organization (WHO) defines telemedicine as the “*delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities*” (WHO, 1998)

Telemedicine has become a key component of the modern healthcare system, especially during the global COVID-19 pandemic.

The National Recovery and Resilience Plan (NRRP) is an initiative aimed at strengthening the health system and promoting digital transformation in the Republic of Croatia. One of the key projects within NRRP is the TeleCordis project, which focuses on improving telemedicine services for patients with cardiovascular diseases in rural areas. According to the

annual report of the Croatian Institute of Public Health, diseases of the heart and blood vessels, known as cardiovascular diseases, are the main cause of death worldwide, and in the Republic of Croatia they account for as much as 45% of all deaths. The most affected group are people over the age of 65, who are at the same time most at risk from mortality caused by the disease COVID-19. In the continental part of Croatia, including rural areas that do not have easy access to local cardiology specialists, patients face higher mortality rates. Those who need simple tests like an EKG Holter must travel to the nearest city that provides such services. Inhabitants of island areas are also at risk because it is difficult to access specialist cardiology services due to geographical distance. This presents a particular problem for the elderly and less mobile population, which faces the challenges of organizing transportation to a specialist center or health center where such services are provided.

This problem also results in additional financial costs for patients, while at the same time health personnel at all levels of health care are not optimally utilized. Therefore, the goal of this project is to increase the availability of specialist cardiology services to residents of rural and island areas through telemedicine, enabling the provision of medical care at a distance.

2 Implementation of the project

As part of the project, the necessary medical and computer equipment was successfully procured. The medical equipment that has been procured includes 12-channel Electrocardiograph (ECG) devices, ECG Holters, pressure Holters and spirometers. In computer procurement, computers, multifunction printers, IP phones and switches were provided for each of the 44 telemedicine centers. The aforementioned equipment was installed at a total of 40 locations of health centers

located in remote and rural areas that previously did not have access to cardiology specialists and 4 specialist telemedicine centers. Also, equipment has been installed in four specialist telemedicine centers that will be used for providing diagnostic services.

The installation of medical equipment at 40 locations of health centers enables the provision of specialist cardiology services at the primary level of health care in remote areas. This reduces the need for patients to travel to distant cities to obtain diagnostic services. This significantly facilitates timely diagnosis and improves the quality of healthcare for patients in rural areas.

The installation of equipment in four specialist telemedicine centers enables the reading and interpretation of the results of diagnostic services. These centers have cardiology specialists who can analyze the collected data and provide expert opinion and advice for further treatment. This enables faster and more accurate diagnostic results, resulting in better management of cardiovascular disease.

Health workers were also trained on the use of telemedicine technologies, which resulted in increased awareness and acceptance of telemedicine as a means of providing health care.

3 Analysis of project goals and results

When looking at the results, it is important to point out that the infrastructure for the transfer of medical data and communication between access and specialist telemedicine centers has been successfully established. In addition to the opening of 40 new telemedicine accesses and 4 telemedicine specialist centers, it should be emphasized that the following was achieved:

1. Increasing the availability of telemedicine services: The TeleCordis project resulted in wider and easier access to telemedicine services for patients with cardiovascular diseases. The aforementioned is measured through an increase in the number of patients who use telemedicine services, a reduction in waiting time for consultations, and monitoring the outcome of conditions for which telemedicine services are provided.
2. Improving the quality of healthcare: The implementation of the TeleCordis project resulted in an improvement in the quality of healthcare provided to patients with cardiovascular diseases. This is manifested through a reduction in the number of complications, improved monitoring of patients' conditions, greater timeliness of diagnosis and treatment, and better management of chronic diseases.
3. Reduction of health system costs: Effective implementation of telemedicine services through the TeleCordis project results in a reduction of

health system costs. This is manifested through a reduction in hospitalizations, a reduction in the number of outpatient visits, savings in patient travel costs and a reduction in the workload of specialist health institutions.

4. Improving patient experience and satisfaction: Through the implementation of telemedicine services, patients with cardiovascular diseases can experience an improved experience and satisfaction with the health care provided. The aforementioned is measured through a questionnaire on patient satisfaction according to the quality of communication with healthcare professionals at a distance, the comfort and practicality of providing healthcare, and the greater involvement of patients in the process of making decisions about their health.

Improvement of the diagnostic process in health care through digitization will enable a modernized and accessible specialist cardiology service at the primary level of health care, rapid diagnosis of patients and improvement of the efficiency of specialists. Technological progress and changes in the health needs of patients require constant updating and adaptation of telemedicine services in order to ensure high quality and relevance of the care provided.

4 Conclusion

The project had a total value of EUR 687,739.07. The implementation period of the project lasted from March 1, 2022 to March 31, 2023. In that time frame, all the goals and results of the project were achieved, contributing to the improvement of the availability and quality of specialist cardiology care in rural areas.

The project opens the door to further development of telemedicine infrastructure and innovations. The introduction of advanced technologies such as artificial intelligence and machine learning can improve diagnostic capabilities, identify early signs of complications and predict risks in patients with cardiovascular disease. These advanced tools can provide additional support to healthcare professionals in making informed decisions about treatment and prevention.

Also, there are challenges that need to be resolved in order to ensure long-term success. Some of these challenges include ensuring the security and protection of data, providing support and education to patients in the use of telemedicine technologies, and ensuring the sustainability of the project after funding from the National Recovery and Resilience Plan ends.

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