

Research article

Cardiac rehabilitation centers in Romania: Where are we now?

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Abstract: Purpose: In 2024, Romania is still facing a critical challenge with high cardiovascular disease mortality rates despite extensive research and policy initiatives. Our study sought to examine the actual state of cardiac rehabilitation in Romania by identifying the healthcare facilities that provide and deliver cardiac rehabilitation services.

Methods: The research began with a comprehensive investigation into cardiac rehabilitation centers across Romania. This involved leveraging search engines to identify these facilities. Keywords like “cardiac rehabilitation”, “cardiovascular rehabilitation”, and “cardiac rehabilitation centers” were instrumental in pinpointing relevant information, which included names, geographical locations, and contact details of the centers. Upon identification of potential centers, our research team initiated direct engagement with these facilities via telephonic interviews.

Results: The data collected in 2024 was compared to previous findings from a 2017 research report to evaluate the progress and impact of prevention efforts over time. While the number of cardiac rehabilitation centers has grown (69.2% increase in the nationwide count of cardiac rehabilitation centers/facilities), an uneven geographic distribution persists, exacerbated by disruptions during the COVID-19 pandemic. Among the cardiac rehabilitation centers identified, 23% are located in balneoclimatic resorts, but the majority of cardiac rehabilitation centers are located in Bucharest.

Overall, 65.3% of all identified centers in Romania belong to the private healthcare sector. Among these private centers, 41.1% offer cardiac rehabilitation programs as continuous inpatient care, with durations ranging from 5 to 16 days. All cardiac rehabilitation centers are equipped with the necessary equipment to perform basic cardiological investigations as well as physio-kinesiological rehabilitative procedures, in addition to aerobic physical training (53.8%). In 33.3% of the identified centers, diabetologists and psychologists/psychotherapists are integral members of the multidisciplinary cardiac rehabilitation team, while only 19.2% of the centers include a dietitian/nutritionist.

Regarding costs, there is significant variation depending on the geographical area. In Bucharest, a single rehabilitation session costs between 100 to 400 lei (20 to 80 €), and a rehabilitation program spanning 4-6 weeks can cost up to 3350 lei. Comparing costs identified in 2017, we have observed an increase ranging from 47% to 188% in 2024.

Conclusions: Despite an increase in the number of cardiac rehabilitation centers, their prevalence remains inadequate to fulfill the demands of the population. Telerehabilitation emerges as a promising solution, with limited adoption in only one center. Cost variations across regions pose a barrier to patient participation. Our article proposes strategies including decision algorithms for personalized recommendations, expanding cardiac rehabilitation centers, and advocating for comprehensive cost reimbursement. The urgent need for collaborative efforts is emphasized, envisioning innovative solutions like mobile applications to foster a sense of community and optimize cardiac rehabilitation, ultimately improving cardiovascular health outcomes in Romania.

Keywords: cardiac rehabilitation, telerehabilitation, cardiac rehabilitation centers, healthcare disparities, cardiovascular health

1. Introduction

In the latest European health reports, cardiovascular diseases remain a significant challenge for healthcare systems worldwide, across Europe, and specifically in Romania. This is underscored by the high mortality rates attributable to cardiovascular causes – approx 57% from the total annual deaths positioning Romania at the forefront of European negative statistics. Despite extensive research, numerous projects, and policies at various levels aimed at controlling risk factors and promoting health, global progress in reducing the incidence of cardiovascular diseases seems to be plateauing. There's a notable improvement in survival rates after cardiovascular events, prompting a focus on reducing overall mortality, rehospitalization rates, and enhancing the quality of life post-event(1–3).

Given the current scenario, the primary emphasis is placed on tertiary prevention, specifically highlighting the significance of cardiac rehabilitation. The aim is not only to prolong life expectancy but also to improve the quality of life and support the social reintegration of individuals impacted by cardiovascular diseases. There is ample globally documented data providing a comprehensive understanding of the importance of these services. This includes the proven importance of cardiac rehabilitation in improving the health status of individuals who have experienced acute cardiovascular events, along with its long-term benefits in preventing complications from chronic cardiac pathologies(4–6).

To comprehend the scale of this issue in Romania and formulate effective rehabilitation strategies, a detailed analysis of available epidemiological data at the national level is imperative. Equally crucial is assessing the accessibility of such therapeutic interventions for the general population. Our analysis in 2023 sought to identify all specialized cardiovascular rehabilitation centers in Romania, their services, population coverage, and the accessibility and acceptability of these services. Drawing from the 2017 research report, "Efficiency Strategies for Cardiovascular Disease Prevention Programs, Regarding Cardiac Rehabilitation in Romania," we compared current data to evaluate whether the efforts of Romanian centers in improving prevention have materialized(7). Additionally, we explored the challenges faced by patients in accessing specialized centers and sought prospective solutions for advancing this sector.

Therefore, cardiac rehabilitation involves a comprehensive and personalized program for patients with cardiovascular conditions, designed to improve heart health and enhance the quality of life for the individuals involved. Cardiac rehabilitation is a patient-centered approach that encompasses several core components, including initial cardiac assessment (ECG, cardiac ultrasound, cardiopulmonary exercise testing), a supervised and individualized program of physical exercises (aerobic exercises, resistance training, stretching, breathing exercises) with continuous monitoring of heart electrical activity and blood pressure profile, nutritional counseling, psychological support, as well as interventions for smoking cessation. Additionally, pharmacological therapy prescribed by a specialist is also a crucial aspect of the comprehensive cardiac rehabilitation program(8–12).

Cardiac rehabilitation covers a broad range of pathologies that affect the proper functioning of the cardiovascular system, and it is especially indicated for patients with acute coronary syndromes, stable angina, and those who have undergone various reperfusion/revascularization interventions (percutaneous coronary intervention, coronary artery bypass grafting)(13–19), patients with heart failure(5,20–22), valvular diseases(23), peripheral artery disease(24,25), arterial hypertension(26,27), arrhythmias(28), post-cardiac surgery(29), implantation of electrical devices (defibrillator, cardiac pacemaker)(30–32). All these pathologies benefit from the effects of cardiac rehabilitation,

namely: the improvement of exercise capacity/cardiorespiratory fitness (CRF) measured by assessing the maximum oxygen volume (VO₂max), which is a benchmark indicator of physical fitness(12,33–35), addressing risk factors (weight control, blood pressure management, cholesterol levels, smoking cessation)(35,36), psycho-emotional rebalancing (alleviation of episodes of anxiety and depression associated with the disease, stress management, reducing levels of discomfort, hostility, and feelings of guilt—some patients may feel like a burden to their families)(33,37,38), and ultimately, improving the quality of life, as measured by various specific assessment questionnaires(19,33,34).

Despite the reported benefits in the specialized literature regarding mortality, readmission rates, and the prevention of exacerbations in cardiovascular patients, cardiac rehabilitation remains an underutilized secondary prevention intervention in current medical practice(10,34,39–45)

This underutilization is attributed to numerous limitations faced by both the patient, the specialist physician, and rehabilitation centers. These limitations will be discussed in the dedicated discussion section, where a series of solutions will be presented to address them, aiming to reduce barriers and increase adherence and recommendations for cardiac rehabilitation.

The percentage of patients receiving a recommendation for enrollment in a personalized cardiac rehabilitation program is low, and the actual participation of patients in such programs is even lower(46,47). However, there are specialized centers that provide cardiac rehabilitation services on an outpatient basis, ensuring careful supervision from specialized staff. The multidisciplinary team includes rehabilitation physicians, cardiologists, kinesiophysiotherapists, occupational therapists, nurses, dietitians/nutritionists, and psychotherapists, working closely together to provide patients with a holistic approach in their cardiac rehabilitation process. This integrated approach contributes to improving the health status of patients and reducing the risk of recurrence of cardiovascular conditions.

Within specialized centers that support cardiac rehabilitation programs, patients are continuously monitored throughout the exercise sessions. An on-site exercise program, physically conducted in a cardiac rehabilitation center, includes aerobic exercises, resistance training, stretching for muscle relaxation, enhancing local and regional vascularization, and avoiding post-exercise injuries. Additionally, respiratory exercises are incorporated to improve respiratory parameters and the activity of respiratory muscles(12,48,49).

Regarding the prescription of physical activity, it is done on an individualized basis, using the fundamental F.I.T.T. principle (Frequency, Intensity, Time (duration), and Type of physical activity)(35). To support healthcare professionals, the European Society of Cardiology (ESC) developed a guideline in 2020 on sports cardiology and physical exercise in patients with cardiovascular diseases. This guideline meticulously documents the characteristics of each type of optimal physical activity based on the associated cardiovascular pathology, providing recommendations for physical activity and limitations to avoid injuries and/or overexertion(50). However, there is a consensus regarding the duration of the sessions, namely 4, 6, 12, or 24 weeks depending on the tolerance to effort, the degree of physical deconditioning, and the clinical-biological status of the patient, with a frequency of 2-3 times per week(51–53).

Despite the categorical recommendations from the American Heart Association (AHA) and the American College of Cardiology (ACC), strongly endorsing cardiac rehabilitation interventions (Class 1, Level of Evidence A), in Romania, the National Health Insurance House covers only 16 days of cardiac rehabilitation services. This discrepancy between international recommendations and national coverage underscores a potential limitation in the access of Romanian patients to the full benefits of cardiac rehabilitation programs, despite their proven importance and effectiveness in improving heart health(54).

In this context, patients are forced to turn to private care facilities equipped with state-of-the-art technology, often associated with costs that exceed their financial capabilities. This reality represents a sensitive issue, where access to high-quality cardiac rehabilitation services becomes contingent on the financial abilities of patients, thereby generating an additional concern regarding ensuring equality in access to quality medical care.

Due to the relatively high number of limitations regarding patients' accessibility to cardiac rehabilitation centers, efforts have been made to implement innovative systems for delivering cardiac rehabilitation remotely using telemedicine. Cardiac rehabilitation via telerehabilitation, a branch of telemedicine, provides medical services remotely through digital tools (phones, tablets, smartwatches, devices connected via Wi-Fi or Bluetooth), and the reported benefits have been comparable to traditional cardiac rehabilitation conducted in a specialized center(33,55–61).

Romania (through the University of Medicine and Pharmacy "Carol Davila") has been an active partner in the European project "Virtual Coaching Activities for Rehabilitation in Elderly" - vCare, funded under the Horizon 2020 framework program - Personalized coaching for well-being and care of people as they age" (grant no. 769807). The project actually aimed, in effective and contributed collaboration with Physical and Rehabilitation Medicine (PRM) doctors and physio-/kinesiotherapists from the Rehabilitation Clinic Division of "Bagdasar-Arseni" Teaching Emergency Hospital to generate personalized and innovative cardiac rehabilitation programs to improve the continuity of medical care and the quality of life for patients using an advanced virtual coaching system. With the assistance of a virtual coach installed on a tablet, the patient was supported throughout the physical activity sessions and encouraged to adopt measures for a healthy lifestyle (notifications for prolonged physical inactivity, e-learning materials) to optimize and reinforce post-condition rehabilitation and prevent further exacerbations. The results of the group that underwent rehabilitation sessions under the guidance of the virtual assistant at home were comparable to those of the group that underwent traditional cardiac rehabilitation on an outpatient basis (57). Therefore, there are initiatives and clear efforts in the development of measures to ensure that cardiac rehabilitation can be carried out optimally and represent a fundamental component in the approach to cardiovascular patients. However, it requires joint efforts from patients, healthcare professionals, as well as competent organizations and institutions.

MATERIALS AND METHODS

To identify cardiac rehabilitation centers in Romania, we conducted a comprehensive investigation into the available facilities. Leveraging the "Google" search engine as our primary tool, we employed key phrases like "cardiac rehabilitation," "cardiovascular rehabilitation," and "cardiac rehabilitation centers". Once we pinpointed these facilities and gathered essential information including names, geographical locations, and contact details (phone numbers, email addresses), our team initiated an investigative process to centralize the data. Individually contacting each center by phone, the authors posed specific questions regarding the implementation of their cardiac rehabilitation programs. These questions focused on aspects such as program duration, session frequency, additional medical investigations, and, where applicable, information about associated costs for participation in programs not covered by the National Health Insurance House.

Furthermore, to supplement our findings, we explored specialized websites and medical databases for relevant articles and abstracts. Utilizing platforms such as PubMed, the National Institutes of Health (NIH), MEDLINE, EMBASE, and the Cochrane Library, we sought additional resources and information pertaining to specific interventions in cardiac rehabilitation.

RESULTS

The evolution of cardiac rehabilitation centres in Romania (2017-2024)

The process of identifying cardiac rehabilitation centers and analyzing their geographic distribution in Romania commenced in 2017. This initiative is an integral component of a doctoral research project titled "Strategies for Enhancing Prevention Programs in Cardiovascular Disease," which served as the foundational framework for the undertaken work(62).

A noticeable imbalance is evident in the distribution of cardiac rehabilitation centers, primarily concentrated in larger cities and their central zones (Figure 1). This trend has persisted consistently, observed both in the initial assessment in 2017 and during the recent research conducted for this study (Figure 2).

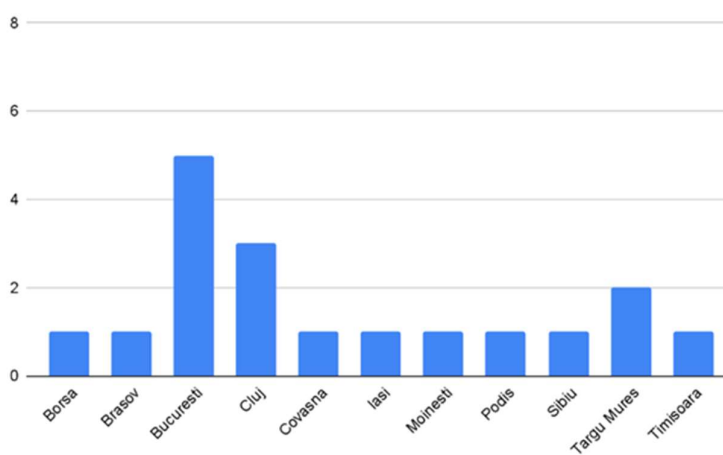


Figure 1. Geographical distribution of cardiac rehabilitation centers in 2017

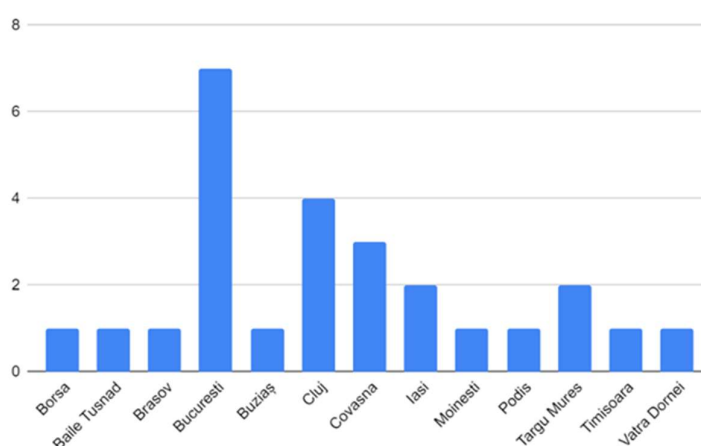


Figure 2. Geographical distribution of cardiac rehabilitation centers in 2024

In 2017, a total of 18 cardiovascular rehabilitation centers were identified in Romania, with 10 (55.56%) integrated into the private medical system. By 2024, the number of these centers had grown to 26, with 17 (65.3%) affiliated with the private medical sector. This expansion marked an approximately 69.2% increase in the nationwide count of cardiac

rehabilitation centers. Notably, during the COVID-19 pandemic, some of these centers were temporarily closed due to the state of alert and government-imposed restrictions. Consequently, a portion of these facilities remain closed, unable to resume their cardiac rehabilitation activity.

Since Romania benefits from physical/chemical sanogenic therapeutic-recuperative factors beneficial to the patients with cardiovascular disorders, part of the state-operated or privately-supported rehabilitation centers are located in balneoclimatic resorts (23%). Moreover, a peculiarity of Romania regarding these natural factors with a cardio-circulatory effects is the presence of shunks. Shunks from Romania are rare worldwide. Their main indication is the prophylactic therapy and rehabilitation of some cardiovascular disorders due to carbon dioxide effect on peripheral circulation and on the hemodynamics of the heart, as well as on cerebral circulation. These are used in pathologies such as: “ post acute myocardial infarction state, ischemic heart disease, chronic arterial and venous peripheral pathology, cardiac failure, post surgical interventions”(63).

A series of balneoclimatic resorts in Romania (mainly Covasna, Vatra Dornei, Tusnad, Buzias), use physical/chemical sanogenic therapeutic-recuperative factors in the treatment centers in which Physical and Rehabilitation Medicine (PRM) doctors work, organized either as medical centers/balnear and rehabilitation clinics, or as part of some balneal accommodation units.

Unfortunately, the accessibility to these rehabilitation centers was disrupted with the onset of the pandemic, exacerbating existing limitations. The state of alert and physical distancing measures led to the suspension of activities in cardiac rehabilitation centers. Although many centers resumed their activity later, some remain closed due to the ongoing impact of the pandemic.

Of the 26 centers identified in 2024, 65.3% belong to the private health sector, as illustrated in Figure 3.

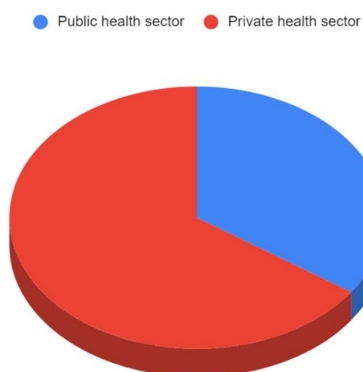


Figure 3. Classification of cardiac rehabilitation centers within the healthcare system (public or private health system)

Among the private centers, 41.1% conduct cardiac rehabilitation programs through continuous inpatient care, lasting from 5 to 16 days (Figure 4). The others provide cardiac rehabilitation services on an outpatient basis or in a combined format (inpatient+outpatient).

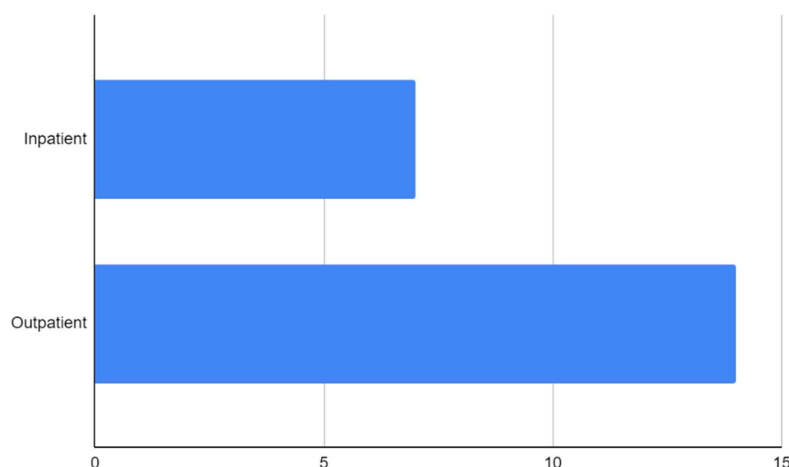


Figure 4. Regimen for conducting cardiac rehabilitation programs in the private healthcare system

In response to the challenges posed by restricted access to medical services during the pandemic, alternative solutions for providing telerehabilitation services have been explored. These alternatives involve the use of smart devices that record and transmit relevant health information to healthcare specialists, offering continuous and personalized insights into patients' health status.

Cardiac telerehabilitation in Romania

Our research team has shown interest in centers that have embraced technology to conduct remote cardiac rehabilitation programs, known as cardiac telerehabilitation. This option proves to be particularly beneficial, especially for patients facing multiple restrictions that impede their participation in traditional cardiac rehabilitation sessions.

Common limitations, such as geographical distance and work-related constraints, can be overcome through telerehabilitation programs. This approach caters to patients in adjacent or rural areas and facilitates the engagement of socio-professionally reintegrated individuals who might struggle to attend on-site rehabilitation sessions. Telerehabilitation also addresses concerns related to a hospital environment, providing a more comfortable and accessible avenue for patients.

While there may be challenges such as weak internet connections or technical issues, the overall benefits of telerehabilitation far outweigh the potential drawbacks. It stands out as an efficient and flexible solution for managing cardiac rehabilitation.

As of now, only one cardiac rehabilitation center in Romania has adopted digital technology for remote patient monitoring. The process involves installing an application on patients' phones and creating a personalized profile. Subsequently, synchronization occurs with a smartwatch, which measures and reports various critical parameters for cardiac health, including pulse, blood pressure, oxygen saturation, and visceral fat level. This initiative represents a significant leap in the field of cardiac rehabilitation, offering substantial benefits through continuous and personalized health monitoring for patients.

The costs of cardiac rehabilitation programs in Romania

Another crucial aspect related to patient adherence to cardiac rehabilitation programs is the cost of these services. Through our investigation, we have identified a range of costs for cardiac rehabilitation programs offered in the private sector. Information was gathered through phone discussions and consultation of the respective centers' websites. The costs associated with cardiac rehabilitation programs exhibit significant variations based on geographical location. Table I records the costs associated with cardiac rehabilitation programs in different geographic regions in Romania (in lei and euros), covering both individual cardiac rehabilitation sessions and extended programs conducted over 4-6 weeks and 8-12 weeks, respectively. The analysis also includes the pricing of remote cardiac rehabilitation packages.

Table I. The price of cardiac rehabilitation packages for private sector-affiliated centers in Romania based on geographical location

Geographic location	The price range for on-site sessions					The price range for remote sessions		
	1 session	5 days	10 days	4-6 weeks	8-12 weeks	1 session	4 weeks	8 weeks
Bucharest	100-400 lei (20-80€)	750-1400 lei (153-285€)	2300 lei (469€)	3350 lei (683€)	4450 lei (908€)	250 lei (51€)	1950 lei (397€)	2400 lei (489€)
Cluj	80 lei (16€)	-	-	-	-	-	-	-
Podiș	-	-	2650 lei (540€)	-	-	-	-	-
Brașov	90 lei (18€)	-	-	-	-	-	-	-
Târgu Mureș	-	-	-	-	-	-	-	-
Iași	100-200 lei (20-40€)	1400 lei (285€)	2300 lei (469€)	-	-	-	-	-

Costs per session cover only kinesiotherapy interventions (without nutritional and/or psychological counseling). However, in certain private clinics, the patient can also choose packages that include nutritional and psychological counseling.

Our research identified that cardiac rehabilitation programs lasting 4-6 weeks include: cardiopulmonary exercise testing at the beginning and end of the recovery period, 12 kinesiotherapy sessions, 4 nutritional sessions (including body composition assessment), one psychological counseling session (including relaxation exercises), and a final cardiological check-up. For cardiac rehabilitation programs lasting 8-12 weeks, the number of kinesiotherapy sessions increases to 36-60.

It is worth noting that before requesting a cardiac rehabilitation session, the patient requires an initial consultation with a cardiologist and/or rehabilitation doctor. Thus, in addition to the costs for a kinesiotherapy session, the costs of an initial medical consultation in the private sector ranging from 300 to 700 lei (60€-140€) are added.

In addition to cardiac rehabilitation sessions, both state and private medical institutions have various complementary investigations aimed at contributing to the progressive

evaluation of the patient's condition or the stratification of cardiovascular risk. This is done to optimize the rehabilitation program based on the clinical and biological status of each individual. This approach aims to minimize the risk of adverse events. Through our research, we identified multiple medical services that provide both the patient and the doctor with a more comprehensive perspective on the pathology and associated risks. Figure 5 illustrates these medical services.

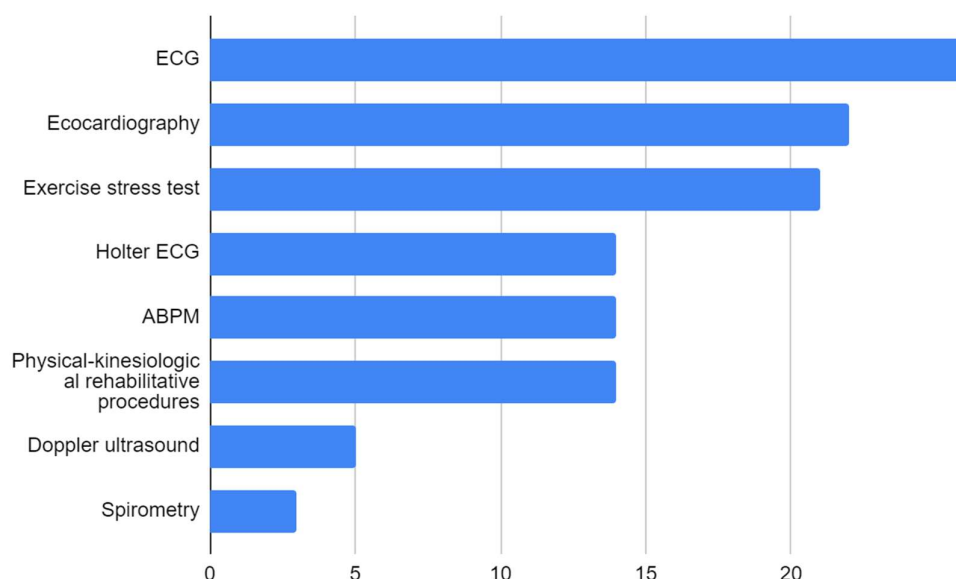


Figure 5. Main medical services provided by state hospitals and private clinics in Romania, used for the evaluation and stratification of cardiovascular risk.

All cardiac rehabilitation centers are equipped with essential medical equipment for basic cardiac evaluation, such as electrocardiography. 22 centers (84.6%) are equipped to perform echocardiography, and 21 centers (80.7%) possess the necessary equipment for conducting exercise stress testing. Regarding the monitoring of heart electrical activity and/or blood pressure over an extended period (24/48/72 hours or more, depending on needs), 53.8% of the centers are equipped with Holter ECG and ABPM devices. Even if the centers are not equipped with these monitoring devices, blood pressure devices are still available. A percentage of 19.2% of cardiac rehabilitation centers have specialists with expertise in vascular ultrasound (arterial and venous), and 11.5% of centers can perform spirometry.

In addition to aerobic physical activity sessions, the patient can also benefit from physiotherapy procedures using certain special devices (muscle electrostimulation, laser, ultrasound, magnetotherapy, thermotherapy etc.) in 53.8% of the cardiac rehabilitation centers in Romania.

Cardiac rehabilitation interventions should include a multidisciplinary team consisting of cardiologists, Physical And Rehabilitation Medicine (PRM) doctors, diabetologists (sometimes), kinesiophysiotherapists, nutritionists/dieticians, psychologists/psychotherapists. Figure 6 illustrates the personnel associated with the cardiac rehabilitation team.

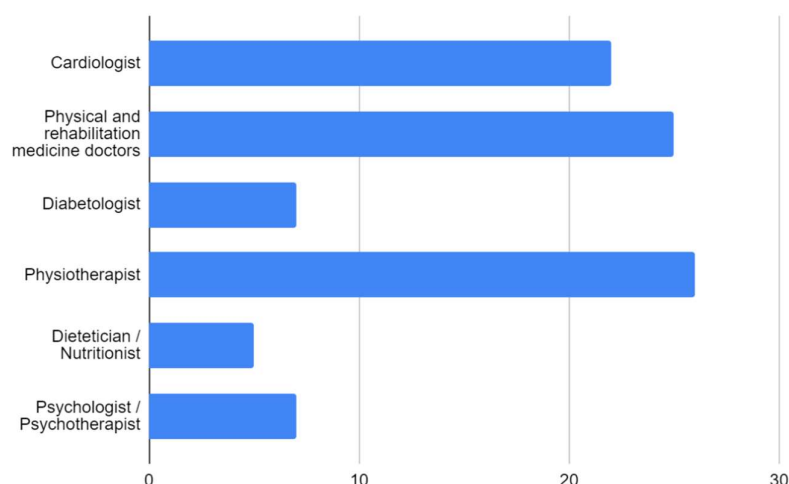


Figure 6. Medical personnel involved in cardiac rehabilitation programs in centers in Romania.

In each of the examined centers, there is at least one cardiologist and a specialized physiotherapist with expertise in cardiac rehabilitation. Notably, in balneological centers, the presence of a cardiologist within the multidisciplinary team is reported in only one center. In 33.3% of these centers, a diabetologist and a psychologist/psychotherapist are integral members of the comprehensive multidisciplinary team. However, it's noteworthy that in only 19.2% of the cardiac rehabilitation centers, an authorized dietitian or nutritionist is included to manage dietary-related changes.

Discussing the pricing of 6-week packages in the private healthcare system for cardiac rehabilitation program, as depicted in Figure 7 for the year 2024 compared to 2017, the obtained data suggests an increase ranging from 47% to 188% across the three analyzed cities—Bucharest, Brasov, and Cluj. The most substantial rise is observed in Cluj, nearly tripling in 2024 compared to 2017, whereas the smallest increase is noted in Bucharest. This trend is likely influenced by factors such as the limited number of centers in the Cluj region, the high population density in that area, coupled with strong purchasing power, and, consequently, the heightened demand for cardiac rehabilitation programs, which is not adequately met by the existing centers.



Figure 7. Prices for private rehabilitation packages in 2024 compared with 2017.

DISCUSSION

Cardiac rehabilitation, while pivotal in treating cardiovascular diseases, faces numerous challenges in Romania, hindering patient enrolment, engagement, and full participation in available programs. These challenges are linked to systemic issues, such as limitations in medical infrastructure, a shortage of rehabilitation centres, and possibly insufficient recommendations from medical specialists. Additionally, individual factors influencing patient decisions contribute to these challenges. Hence, our objective is to heighten awareness of these deficiencies and propose strategies for rectifying them within the Romanian healthcare landscape.

Echoing global concerns, Romanian patients face obstacles akin to those highlighted in a 2021 review, spanning operational hours, proximity to specialized centres, associated costs, individual preferences, and a lack of sustained commitment to rehabilitation programs. These challenges underscore a prevalent lack of awareness regarding the role and potential benefits of comprehensive cardiac rehabilitation. By implementing adaptive programs customized to individual needs and integrating technology, we can enhance patient engagement, ultimately optimizing program outcomes(64).

In Romania, the shortage of rehabilitation centers, in contrast to other European countries, highlights the imperative for expanded services. Establishing new specialized centers across diverse regions could markedly improve healthcare accessibility, redistribute patient enrollment, deliver comprehensive medical services, and optimize the operational capacities of these facilities. The Romanian healthcare system faces a spectrum of challenges, ranging from the absence of an integrated model and limited rehabilitation centers to issues concerning recommendations, accessibility, and insufficient coverage of costs by health insurance(65).

Existing rehabilitation programs are currently underutilized, partially due to the lack of robust recommendations from specialists in the field. Urgent support for current rehabilitation centers is crucial to expand service provisions and accommodate a larger cohort of patients in need. Strengthening specialist medical endorsements can be achieved through early exposure, raising awareness of the benefits of cardiac rehabilitation, and disseminating positive outcomes from enrolled patients(66,67).

To bolster this healthcare sector, advocating for investments and endorsing policies that ensure comprehensive cost reimbursement, either through full subsidization or financial support from the national health insurance system, is essential. Embracing a hybrid funding model, akin to systems observed in countries with well-established capacities, represents a pragmatic solution to extend services to a broader patient base(67–70).

Telerehabilitation: Bridging Gaps for Cardiac Care – The Solution and the Horizon

To streamline the recommendation process, the creation and implementation of decision algorithms, relying on patient information and clinical guidelines, can automate the provision of personalized recommendations for cardiac rehabilitation programs. This ensures that each patient receives tailored guidance based on their specific needs and medical considerations.

Drawing inspiration from the Australian engine (Heart Foundation) for identifying the nearest cardiac rehabilitation center based on the provided address, a comprehensive solution involves integrating a geolocation system and developing a user-friendly digital platform(71). This platform, designed for both healthcare professionals and patients, aims to enhance accessibility to cardiac rehabilitation services. An online form within the platform could streamline the assessment of the need for cardiac rehabilitation, display available facilities at each center, and enable convenient scheduling of appointments at the nearest cardiac rehabilitation facility.

As a strategic expansion to the existing network of centers and a means to improve patient access, telerehabilitation emerges as a viable solution. Recent studies affirm the effectiveness of alternative models utilizing current technology, proving them as impactful as traditional on-site cardiac rehabilitation programs. These models bring several advantages, including heightened patient engagement, sustained motivation, program flexibility, and the ongoing promotion of a healthier lifestyle, all while removing the geographical barrier to accessing medical services(72,73).

Further enhancing healthcare services, the development of telemedicine through a dedicated mobile application for cardiac rehabilitation offers the innovative prospect of remote rehabilitation. This solution entails continuous monitoring facilitated by state-of-the-art technology and functional features, providing patients with a flexible and convenient option for their rehabilitation(73).

A personalized touch can be achieved through flexible programs tailored to meet the unique needs of individual patients. Notably, the Cardionline application, launched in 2022 as part of a telemonitoring initiative, not only improves access to cardiac rehabilitation programs but also offers continuous tracking through wearable devices. The application serves as a support system, encouraging patient adherence to the program and treatment, ultimately contributing to sustained long-term improvements by offering practical lifestyle advice(74).

Embracing such approaches not only streamlines the enrollment and utilization processes but also ensures a more consistent and uniform recommendation at the national level. This holistic solution holds the potential to significantly advance the accessibility, efficiency, and effectiveness of cardiac rehabilitation services.

Furthermore, establishing a dynamic and user-friendly virtual platform to facilitate interaction among patients navigating cardiac health rehabilitation has the potential to foster a sense of community, encourage the sharing of experiences, and promote mutual support. This hypothesis suggests that such a platform, enriched with expert resources and personalized guidance, can empower users to actively engage in their rehabilitation journey, resulting in improved well-being and sustained adherence to a heart-healthy lifestyle. This innovative approach aims to go beyond traditional patient forums, establishing a comprehensive virtual community that enhances connectivity, learning, and support among individuals with shared cardiac experiences.

CONCLUSION

Cardiovascular rehabilitation faces significant challenges in gaining acceptance among both the general population and healthcare professionals in Romania. The limited funding allocated to this branch of cardiology poses considerable barriers for public and private centers striving to conduct and advance cardiovascular rehabilitation activities. The distribution of cardiac rehabilitation centers across Romania is noticeably skewed, with a concentration in the capital area, likely due to the higher per capita income, facilitating more accessible services. This challenge is further emphasized by the discrepancy between international recommendations and restricted national coverage, potentially limiting Romanian patients' access to the full benefits of cardiac rehabilitation programs.

Despite an observed increase in the number of cardiac rehabilitation centers in Romania from 2017 to the present, this growth has not adequately met the needs of patients who have experienced cardiac events and require comprehensive, multidisciplinary approaches for secondary prevention. An analysis of the conduction form and program duration reveals a lack of standardization in cardiac rehabilitation protocols compared to prevailing specialty guidelines. Due to inadequate financial support, state centers fall short of meeting the minimum standard period of 6 weeks, and the cost of cardiac rehabilitation in private centers, when correlated with the minimum wage, becomes prohibitively high, limiting accessibility for a broader population.

Within this national context, there is a strong need to identify cost-effective solutions for patients with cardiovascular disease. The implementation of an online cardiac rehabilitation system holds promise in reducing patient utilization costs by streamlining personnel and indirect expenses. Simultaneously, patients gain more autonomy, as they can follow a personalized, standardized, and supervised cardiac rehabilitation program within the comfort of their homes.

The future holds promise for telerehabilitation, as ongoing advancements in medicine are expected to empower patients to access high-quality medical care, not only in the realm of cardiac rehabilitation but also across diverse healthcare domains.

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