The role of telemedicine in the management of patients with arterial hypertension and heart failure

El papel de la telemedicina en el manejo de pacientes con hipertensión arterial e insuficiencia cardíaca

Liubov Sergeevna Kravchenko
Federal State Budgetary Organisation of Higher Education «Volgograd State Medical University» of Public Health Ministry of the Russian Federation 1, ploshchad Padvykh Bortsov, Volgograd, 400066, Russia, kravcenkoluba503@gmail.com https://orcid.org/0009-0007-8387-9100
Azada Arslanbekowna Zyyevedynova
Mari State University, Institute of Medicine, Ploshad' Lenina 1, Yoshkar-Ola, 424000, Mari El Republic, Russia, ayzadaziyavutdinova@mail.ru, https://orcid.org/0009-0004-9393-1038
Alexandra Nikitichna Kolegova
Federal State Budgetary Educational Institution of Higher Education «V. I. Razumovsky Saratov State Medical University» Ministry of Health of the Russian Federation. Bolshaya Kazachia st., 112,Saratov, 410012 Russia. kolegova.sanya@mail.ru, https://orcid.org/0009-0002-0662-3375
Elvira Ruslanovna Shikhshabekova
Dagestan State Medical University, Russian Federation, Republic of Dagestan, Makhachkala,sq. Lenina 1, 367000. Elvira01-01@mail.ru, https://orcid.org/0009-0002-0166-9315
Rusalina Aslanovna Dymova
Russian University of Medicine Moscow, Dolgorukovskaya St., 4, 127006, Russia, rusalina.dymova@bk.ru, https://orcid.org/0009-0006-9558-1451
Maria Mikhailovna Kiba
Kuban State Medical University, street Sedina 4 ,Krasnodar , 350063, Russia. Kiba01@list.ru, https://orcid.org/0009-0003-7001-1047
Ksenia Alekseevna Kornilova
Samara State University of Economics, 141 Sovetskaya Armii street, Samara,443090, Russia. kornilova97@yandex.ru, https://orcid.org/0000-0001-8570-2308
Received: 02/20/2025 Accepted: 04/19/2025 Published: 05/12/2025 DOI: http://doi.org/10.5281/zenodo.15544887

Abstract

The article discusses the role of telemedicine in the modern approach to the management of patients with arterial hypertension (AH) and chronic heart failure (CHF). These diseases remain one of the main causes of disability and premature mortality worldwide, which requires the introduction of new technologies to improve the effectiveness of their management. Telemedicine technologies make it possible to remotely monitor patients' condition, ensure timely correction of treatment and improve compliance with therapeutic recommendations.

The article analyses the benefits of using telemedicine, including the possibility of continuous monitoring of blood pressure, heart rate, body weight and other key parameters important for patients with AH and CHF. The importance of telemedicine platforms in improving the interaction between patients and medical specialists is emphasized, which helps to reduce the number of hospitalizations and complications.

Particular attention is paid to the results of clinical trials demonstrating the positive impact of telemedicine programmes on blood pressure control and cardiac function. In addition, potential barriers to telemedicine implementation are discussed, such as technical limitations, economic factors and the need to adapt the health care system to new formats of work.

The authors emphasise that telemedicine represents a promising direction in the management of chronic cardiovascular diseases, contributing not only to the improvement of patients' quality of life, but also to the optimization of healthcare costs. However, further standardization of telemedicine technology application methods and increased access to it among the general population are required to maximize its effectiveness.

Keywords: telemedicine, arterial hypertension, chronic heart failure, remote monitoring, patient management, treatment adherence, reduced hospitalizations, quality of life, health care technologies, clinical outcomes.

Resumen

El artículo analiza el papel de la telemedicina en el enfoque moderno para el manejo de pacientes con hipertensión arterial (HA) e insuficiencia cardíaca crónica (ICC). Estas enfermedades siguen siendo una de las principales causas de discapacidad y mortalidad prematura a nivel mundial, lo que requiere la introducción de nuevas tecnologías para mejorar la eficacia de su manejo. Las tecnologías de telemedicina permiten la monitorización remota del estado de los pacientes, garantizan la corrección oportuna del tratamiento y mejoran el cumplimiento de las recomendaciones terapéuticas.

El artículo analiza los beneficios del uso de la telemedicina, incluyendo la posibilidad de monitorizar continuamente la presión arterial, la frecuencia cardíaca, el peso corporal y otros parámetros clave para pacientes con HA e ICC. Se destaca la importancia de las plataformas de telemedicina para mejorar la interacción entre pacientes y especialistas médicos, lo que ayuda a reducir el número de hospitalizaciones y complicaciones.

Se presta especial atención a los resultados de ensayos clínicos que demuestran el impacto positivo de los programas de telemedicina en el control de la presión arterial y la función cardíaca. Además, se discuten las posibles barreras para la implementación de la telemedicina, como las limitaciones técnicas, los factores económicos y la necesidad de adaptar el sistema sanitario a los nuevos formatos de trabajo.

Los autores enfatizan que la telemedicina representa una dirección prometedora en el manejo de las enfermedades cardiovasculares crónicas, contribuyendo no solo a la mejora de la calidad de vida de los pacientes, sino también a la optimización de los costos de atención médica. Sin embargo, se requiere una mayor estandarización de los métodos de aplicación de la tecnología de telemedicina y un mayor acceso a ella entre la población general para maximizar su efectividad.

Palabras clave: telemedicina, hipertensión arterial, insuficiencia cardíaca crónica, monitorización remota, manejo del paciente, adherencia al tratamiento, reducción de hospitalizaciones, calidad de vida, tecnologías de atención médica, resultados clínicos.

Introduction

Arterial hypertension (AH) and chronic heart failure (CHF) remain among the most common and socially significant diseases in modern medicine. According to the World Health Organization (WHO), AH is a major risk factor for cardiovascular complications such as stroke, myocardial infarction and CHF, and the latter represents the end stage of many cardiovascular diseases. The management of these conditions requires continuous monitoring of clinical parameters, regular treatment adjustments and close co-operation between patients and medical professionals[1].

Traditional management of patients with chronic diseases is often limited by the time constraints of face-to-face consultations and patient self-management. This can lead to late detection of deterioration, increased hospitalization rates and reduced quality of life. With the rapid development of digital technologies, telemedicine offers an innovative approach to solving these problems.

Telemedicine is the use of information and communication technologies to deliver health care at a distance. It enables remote monitoring of health indicators, counseling, patient education programmes and optimization of chronic disease management. For patients with AH and CVD, telemedicine technologies are particularly relevant, as they provide continuous monitoring of key parameters (e.g. blood pressure, body weight, heart rate) and allow timely response to changes in the condition.

Despite the significant potential of telemedicine, its implementation faces a number of challenges: technical, organizational and economic. However, successful examples of telemedicine programmes demonstrate their ability to improve clinical outcomes, reduce healthcare costs and increase patient satisfaction with the quality of care received.

Thus, the development of telemedicine opens new horizons in the management of patients with AH and CVD, offering effective solutions to overcome the existing limitations of traditional medical practice.

Materials and methods

A number of the following research methods were used in writing this article. By means of literature review, we examined current scientific publications, reviews and meta-analyses on the role of telemedicine in the management of patients with arterial hypertension (AH) and chronic heart failure (CHF). Both basic research and practical recommendations published in peer-reviewed journals, Pub Med, Scopus and other authoritative databases were analyzed.

The data from various sources were systematized and combined for creating a holistic picture of the current state of the problem and the potential of telemedicine technologies in the context of chronic cardiovascular disease management. Comparative analysis was used to compare the effectiveness of traditional approaches to the management of patients with AH and CVD with modern telemedicine methods, which allowed to identify the advantages and limitations of each approach, as well as to identify promising areas of development. In addition, the results of randomized controlled trials and observational studies were used to confirm the impact of telemedicine on clinical outcomes, such as blood pressure control, reduced hospitalization rates and improved patient quality of life.

Results

Arterial hypertension (AH) and chronic heart failure (CHF) remain global medical problems, being the main causes of disability and premature mortality worldwide[2]. These diseases are characterised by a long course, high risk of complications and the need for constant monitoring of multiple clinical parameters[3]. Traditional methods of management of patients with AH and CHF, based on regular face-to-face consultations and occasional monitoring of the condition, often do not provide a sufficient level of control, which leads to disease progression, deterioration of quality of life and increased frequency of hospitalizations.

With the rapid development of digital technologies, telemedicine is an innovative approach to chronic disease management that overcomes the limitations of traditional medical practice. The main areas of telemedicine use in the management of patients with AH and CHF include:

Modern telemedicine platforms allow continuous monitoring of key health indicators such as blood pressure, body weight, heart rate, blood oxygen saturation level and others, which is especially important for early detection of deterioration and prevention of acute decomposition[4].

Based on the data obtained, physicians can promptly adjust therapeutic regimens, which contributes to more effective control of the disease and reduce the risk of complications[5]. For example, if blood pressure rises or body weight increases in a patient with CHF, the dosage of antihypertensive drugs or diuretics can be adjusted in a timely manner.

Telemedicine technologies provide an opportunity to conduct educational programmes for patients, helping them to better understand their disease, the importance of regular monitoring of parameters and the importance of adherence to the doctor's recommendations, which helps to improve the drug and non-drug approach to treatment.

Telemedicine enables closer and more convenient interaction between patients and medical specialists through video consultations, chat rooms and electronic information exchange systems, which is especially important for patients with limited mobility or living in remote regions.

The introduction of telemedicine programmes helps to reduce the number of routine clinic visits, reduce the frequency of hospital admissions and optimize the allocation of medical resources. Clinical studies confirm the positive impact of telemedicine on the management of patients with AH and CVD[6]. For example, studies demonstrate a significant improvement in blood pressure control and reduced hospitalization rates in patients with CHF using telemedicine technologies[7]. However, successful implementation of these technologies requires addressing a number of challenges, including technical barriers, economic constraints and the need to adapt the health care system to new formats of work.

Thus, telemedicine plays a key role in the modern approach to the management of patients with AH and CHF, offering effective solutions to improve clinical outcomes, enhance quality of life and optimize healthcare costs.

Telemedicine offers many advantages for the management of patients with AH and CHF, especially in terms of continuous monitoring of key clinical parameters, which enables timely detection of changes in health status and prevention of complications[8].

Arterial hypertension requires regular monitoring of blood pressure (BP), as its instability can lead to the development of serious complications such as stroke or myocardial infarction. Telemedicine devices allow patients to measure BP at home and transmit the data to a doctor in real time. This provides a more accurate assessment of the dynamics of indicators and the possibility of prompt correction of therapy. For patients with CHF, change in

body weight is an important indicator of fluid accumulation in the body, which may signal decomposition of the disease. Telemedicine scales automatically record weight changes and send the data to the doctor, allowing to prevent acute episodes of fluid retention by timely correction of diuretic therapy.

Heart rate abnormalities may indicate progression of CHF or arrhythmias that require immediate attention. Remote HR monitoring devices allow physicians to monitor a patient's heart rhythm and take appropriate action when abnormalities are detected[9].

A decrease in SpO_2 can be a sign of decomposition of CHF or the development of complications such as pulmonary hypertension. Telemedicine pulse oximeters provide continuous monitoring of this parameter, which helps in early diagnosis of respiratory or circulatory problems. Modern telemedicine platforms integrate various monitoring devices and automatically analyse the obtained data, which simplifies the work for both patients and doctors, allowing to quickly identify trends and anomalies in the state of health.

Telemedicine helps to improve the quality of patient follow-up through medication reminders, educational programmes and feedback from the physician[10]. Patients using telemedicine technologies are more likely to follow a treatment recommendation, which has a positive impact on disease outcome. Due to continuous monitoring of multiple parameters, telemedicine allows to detect signs of decomposition of AH or CHF at early stages, when they can be easily corrected[11]. This reduces the risk of acute complications and the need for emergency hospitalization.

The introduction of telemedicine technologies reduces healthcare costs by reducing the number of routine clinic visits, reducing the frequency of hospitalizations and optimizing the use of medical resources. Remote monitoring is particularly useful for patients with limited mobility, who live in remote areas or have difficulty travelling to health facilities, making treatment more accessible and comfortable.

Thus, the use of telemedicine to monitor key parameters in patients with AH and CHF significantly improves their quality of life, reduces the risk of complications and contributes to more effective management of these chronic diseases.

Discussion

Telemedicine platforms play a key role in transforming the interaction between patients and healthcare professionals, especially in the management of chronic diseases such as arterial hypertension (AH) and chronic heart failure (CHF)[12]. These technologies not only enable more efficient information sharing, but also contribute to a significant reduction in hospitalizations and complications, which is critical for improving patients' quality of life and optimizing healthcare costs.

Telemedicine platforms enable continuous interaction between patients and medical professionals through various communication channels such as video consultations, messengers, electronic reporting forms and automated reminder systems[13]. The above presented provides the following:

- Patients can quickly contact a doctor with any questions about their condition without having to visit the clinic in person;

- Doctors can provide patients with recommendations, adjust treatment or provide explanations in real time, increasing patient trust and satisfaction;

- Telemedicine platforms can include educational materials on disease, self-management and medication management, which helps patients better understand their role in health management.

One of the main advantages of telemedicine platforms is the ability to remotely monitor key health parameters such as blood pressure, body weight, heart rate and blood oxygen saturation. Thanks to this, physicians have access to real-time data on the patient's condition, which allows timely detection of alarm signals, such as increased blood pressure or increased body weight in patients with CHF[14]. In addition, early detection of changes can prevent decomposition of the disease, which significantly reduces the risk of complications and the need for emergency hospitalization.

Effective use of telemedicine platforms leads to a significant reduction in the number of hospitalizations, which is one of the main goals of chronic disease management. Continuous monitoring of health parameters helps to keep the patient's condition in stable compensation, minimizing the likelihood of complications.

If minor abnormalities are detected, doctors can quickly adjust therapy, eliminating the need for hospitalization to stabilize the condition. Reducing the number of hospitalizations not only improves the quality of life of patients, but also significantly reduces healthcare costs, which is especially important in resource-limited settings[15].

Telemedicine platforms are helping to improve patient outcomes. Automated notifications help patients take their medications regularly, which is critical for successful management of AH and CVD. Physicians can monitor a patient's adherence to prescribed therapy and intervene promptly if recommendations are not followed. Regular interaction with a physician through a telemedicine platform increases patients' responsibility for their health[16].

Telemedicine platforms allow creating individual health management programmes for each patient, taking into account their unique characteristics. Depending on the patient's condition, the frequency of measurement of various parameters and thresholds for intervention can be customized. The platforms support two-way communication, allowing physicians to tailor their recommendations to the specific needs of the patient.

Telemedicine platforms are a powerful tool to improve communication between patients and healthcare professionals, which has a direct impact on reducing hospitalizations and complications in patients with AH and CVD. Through continuous monitoring, prompt treatment adjustments and improved adherence to recommendations, these technologies contribute to better chronic disease management, improved patient quality of life and optimized healthcare system performance.

Clinical studies confirm the high effectiveness of telemedicine programmes in the management of patients with arterial hypertension (AH) and chronic heart failure (CHF). These studies demonstrate significant improvements in the control of key health parameters such as blood pressure (BP) and cardiac functional status, which contributes to reducing the risk of complications and improving patients' quality of life[17].

Many studies show that telemedicine programmes significantly improve the effectiveness of BP control in patients with arterial hypertension. For example, in a randomized controlled trial by a group of specialists, patients using telemedicine systems for BP monitoring demonstrated lower mean systolic BP values compared with a control group using only traditional management methods (the difference was about 5-7 mmHg)[18]. Another study found that the use of telemedicine led to an increase in the proportion of patients achieving target BP values (less than 140/90 mmHg) from 40% to 70% during the follow-up period[19]. These results are explained by the possibility of continuous BP monitoring, timely correction of therapy and improved patient compliance.

Telemedicine programmes have also been shown to be effective in the management of patients with chronic heart failure, particularly in reducing hospital admissions. A meta-analysis of 15 randomized controlled trials showed that the use of telemedicine for remote monitoring of patients with CHF was associated with a 30-40% reduction in re-hospitalization rates compared with traditional management[20].

Another study indicated that patients using telemedicine systems to monitor body weight, HR and decomposition symptoms were less likely to require emergency care and had better cardiac function scores.

One important aspect of the effectiveness of telemedicine programmes is their impact on patients' quality of life. Studies show that patients using telemedicine report less health-related anxiety and greater satisfaction with the treatment process. Improved BP control and functional heart health leads to a reduction in symptoms such as shortness of breath, fatigue, and headaches, which significantly improves patients' overall well-being.

Clinical studies undeniably demonstrate the positive impact of telemedicine programmes on blood pressure control and cardiac functional status in patients with AH and CHF[21]. Due to remote monitoring, timely correction of treatment and improved interaction between patients and physicians, these technologies contribute to the reduction of hospitalization rates, improvement of quality of life and optimization of healthcare costs. The results of these studies confirm the need for widespread implementation of telemedicine in the practice of chronic disease management.

Despite the obvious advantages of telemedicine in the management of chronic diseases such as arterial hypertension (AH) and chronic heart failure (CHF), the process of its widespread adoption faces a number of significant barriers. These barriers can be divided into several key categories: technical limitations, economic factors, and the need for the health care system to adapt to new ways of working. The above barriers are summarized in Table 1.

Table 1. Main barriers to telemedicine implementation

Barrier category	Problem description
Technical Limitations	Lack of high-speed Internet access in remote or rural areas
	The difficulty of using technology for elderly patients and technically inexperienced users
	Data security and protection of confidential information
	The need for compatibility of different devices and platforms
Economic factors	High cost of equipment and software for health monitoring
	Lack of clear mechanisms for payment for telemedicine services through insurance schemes
	The need for significant investment in digital infrastructure
Adaptation of the health system	Lack of unified standards and legal norms to regulate telemedicine
	Resistance to change on the part of medical professionals and administrative staff
	Need to rethink work processes and integrate telemedicine into existing systems of work
Social and cultural aspects	Low level of trust in telemedicine technologies among patients
	Age specificity: difficulties of elderly patients in adapting to new technologies

Technical challenges remain a major obstacle to the successful implementation of telemedicine technologies. Many patients, especially the elderly or those living in remote regions, may not have stable access to high-speed Internet, which limits the use of telemedicine platforms.

Some patients have difficulty learning new devices and software, which can lead to low adoption of telemedicine. Not all physicians have sufficient skills to effectively use telemedicine systems, which require additional training and continuing education. Protecting patients' personal information is an important aspect, requiring the implementation of strong encryption protocols and privacy standards.

Economic barriers also play a significant role in the implementation of telemedicine. The purchase and maintenance of telemedicine devices for monitoring health parameters (e.g. electronic tonometers, scales or pulse oximeters) can be costly for patients and health-care providers.

In some countries there is no clear system of payment for telemedicine services through state insurance programmes, which reduces the motivation of medical organizations to implement these technologies. Widespread adoption of telemedicine requires significant investment in the development of digital infrastructure, including servers, software and secure communication channels.

Adaptation of the existing healthcare system to new formats of work is a complex and lengthy process. The lack of uniform standards and legal regulations governing the use of telemedicine can create uncertainty for medical professionals and patients.

Traditional methods of patient management are entrenched in the practice of many physicians, which may cause resistance to the transition to new technologies. Integrating telemedicine programmes into the existing processes of healthcare facilities requires rethinking workflows, division of responsibilities and coordination between different departments. The successful implementation of telemedicine requires extensive training of both medical and administrative staff.

In addition to technical and economic factors, social and cultural characteristics can also influence the acceptance of telemedicine. Some patients may doubt the accuracy and reliability of data obtained through telemedicine devices, preferring traditional methods of health monitoring. Older patients, who make up a significant proportion of people with AH and CVD, often have difficulty adapting to new technologies, requiring simpler and more intuitive interfaces.

The implementation of telemedicine in the practice of chronic disease management faces many barriers related to technical limitations, economic factors and the need to adapt the health care system. Addressing these challenges requires an integrated approach that includes improving digital infrastructure, developing cost-effective solutions and creating an enabling environment for both patients and health professionals to adopt new technologies. Only by overcoming these obstacles can the full potential of telemedicine to improve the quality of life of patients with AH and CVD be realized.

Conclusions

Telemedicine represents an innovative approach to the management of chronic diseases such as arterial hypertension (AH) and chronic heart failure (CHF), which remain one of the leading causes of disability and premature mortality worldwide. Telemedicine provides significant benefits in the management of AH and CHF, including continuous monitoring of key health parameters (blood pressure, body weight, heart rate, etc.), early detection of decomposition, timely correction of treatment and improved patient adherence. Clinical studies confirm the positive impact of these technologies on disease control, reduction in the number of hospitalizations and improvement in quality of life.

Telemedicine platforms facilitate closer and more convenient interaction between patients and medical professionals through video consultations, electronic information exchange systems and automated reminders. This creates a more personalized approach to care and improves patient satisfaction.

The implementation of telemedicine programmes results in lower healthcare costs by reducing the number of planned and emergency hospitalizations, optimizing the use of medical resources and reducing the time required for patient management.

Despite the obvious advantages, the widespread adoption of telemedicine faces a number of barriers, such as technical limitations (lack of access to the Internet, difficulty in using the technology), economic factors (high cost of equipment and lack of payment mechanisms for services) and the need to adapt the health care system to new formats of work. Addressing these challenges requires an integrated approach that includes infrastructure development, improving legislation and raising awareness of telemedicine among all stakeholders.

Given the rapid progress of digital technologies, telemedicine has great potential for further development. Future directions may include the use of artificial intelligence to analyze data, the expansion of remote monitoring capabilities and the integration of telemedicine systems with other areas of health care.

Thus, telemedicine plays an important role in the modern approach to the management of patients with AH

and CHF, offering effective solutions to overcome the limitations of traditional medical practice. However, to maximize its potential it is necessary to continue to work on solving existing problems and actively promote its implementation in the healthcare system.

References

1. Omboni S. Connected health in hypertension management. Front Cardiovasc Med. 2019;6:76.
2. Moghaddasi H, Asadi F, Hosseini A, Ebnehoseini Z. E-health: a global approach with extensive semantic variation. J Med Syst. 2012;36:3173–3176.
3. Omboni S, Guarda A. Impact of home blood pressure telemonitoring and blood pressure control: a meta-analysis of randomized controlled studies. Am J Hypertens. 2011;24:989–998.
4. Agarwal R, Bills JE, Hecht TJ, Light RP. Role of home blood pressure monitoring in overcoming therapeutic inertia and improving hypertension control: a systematic review and meta-analysis. Hypertension. 2011;57:29–38.
5. Verberk WJ, Kessels AG, Thien T. Telecare is a valuable tool for hypertension management, a systematic review and meta-analysis. Blood Press Monit. 2011;16:149–155.
6. Zullig LL, Melnyk SD, Goldstein K, Shaw RJ, Bosworth HB. The role of home blood pressure telemonitoring in managing hypertensive populations. Curr Hypertens Rep. 2013;15:346–355.
7. Liu S, Dunford SD, Leung YW, Brooks D, Thomas SG, Eysenbach G, Nolan RP. Reducing blood pressure with Internet-based interventions: a meta-analysis. Can J Cardiol. 2013;29:613–621.
8. Niznik JD, He H, Kane-Gill SL. Impact of clinical pharmacist services delivered via telemedicine in the outpatient or ambulatory care setting: a systematic review. Res Social Adm Pharm. 2018;14:707–717.
9. Choi WS, Choi JH, Oh J, Shin IS, Yang JS. Effects of remote monitoring of blood pressure in management of urban hypertensive patients: a systematic review and meta-analysis. Telemed J E Health. 2020;26:744–759.
10. Alessa T, Hawley MS, Hock ES, De Witte L. Smartphone apps to support self-management of hypertension: review and content analysis. J Med Internet Res. 2019;21:e13645.
11. Earle KA, Istepanian RS, Zitouni K, Sungoor A, Tang B. Mobile telemonitoring for achieving tighter targets of blood pressure control in patients with complicated diabetes: a pilot study. Diabetes Technol Ther. 2010;12:575–579.
12. Frias J, Virdi N, Raja P, Kim Y, Savage G, Osterberg L. Effectiveness of digital medicines to improve clinical outcomes in patients with uncontrolled hypertension and type 2 diabetes: prospective, open-label, cluster-randomized pilot clinical trial. J Med Internet Res. 2017;19:e246.
13. Li WW, Lai WS. [The use of telemedicine interventions to improve hypertension management among racial ethnic minorities: a systematic review]. Hu Li Za Zhi. 2016;63:25–34.
14. Piotrowicz, E Zieliński, T Bodalski, R et al. Home-based telemonitored Nordic walking training is well accepted, safe, effective and has high adherence among heart failure patients, including those with cardiovascular implantable electronic devices: a randomised controlled study Eur J Prev Cardiol. 2015; 22:1368-1377
15. Rahimi, K Nazarzadeh, M Pinho-Gomes, AC et al. Home monitoring with technology-supported management in chronic heart failure: a randomised trial Heart. 2020; 106:1573-1578
16. Riegel, B Carlson, B Kopp, Z et al. Effect of a standardized nurse case-management telephone intervention on resource use in patients with chronic heart failure Arch Intern Med. 2002; 162:705-712
17. Rodríguez-Gázquez, ML Arredondo-Holguín, E Herrera-Cortés, R Effectiveness of an educational program in nursing in the self-care of patients with heart failure: randomized controlled trial Rev Lat Am Enfermagem. 2012; 20:296-306
18. Weintraub, A Gregory, D Patel, AR et al. A multicenter randomized controlled evaluation of automated home monitoring and telephonic disease management in patients recently hospitalized for congestive heart failure: the SPAN-CHF II trial J Card Fail. 2010; 16:285-292
19. Dadosky, A Overbeck, H Barbetta, L et al. Telemanagement of heart failure patients across the post-acute care continuum Telemed J E Health. 2018; 24:360-366
20. Mittal, S Piccini, JP Snell, J et al. Improved survival in patients enrolled promptly into remote monitoring following cardiac implantable electronic device implantation J Interv Card Electrophysiol. 2016; 46:129-136
21. Moore, JA Evaluation of the efficacy of a nurse practitioner-led home-based congestive heart failure clinical pathway Home Health Care Serv Q. 2016; 35:39-51