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Essential knowledge for self-care in cardiovascular rehabilitation: an integrative review

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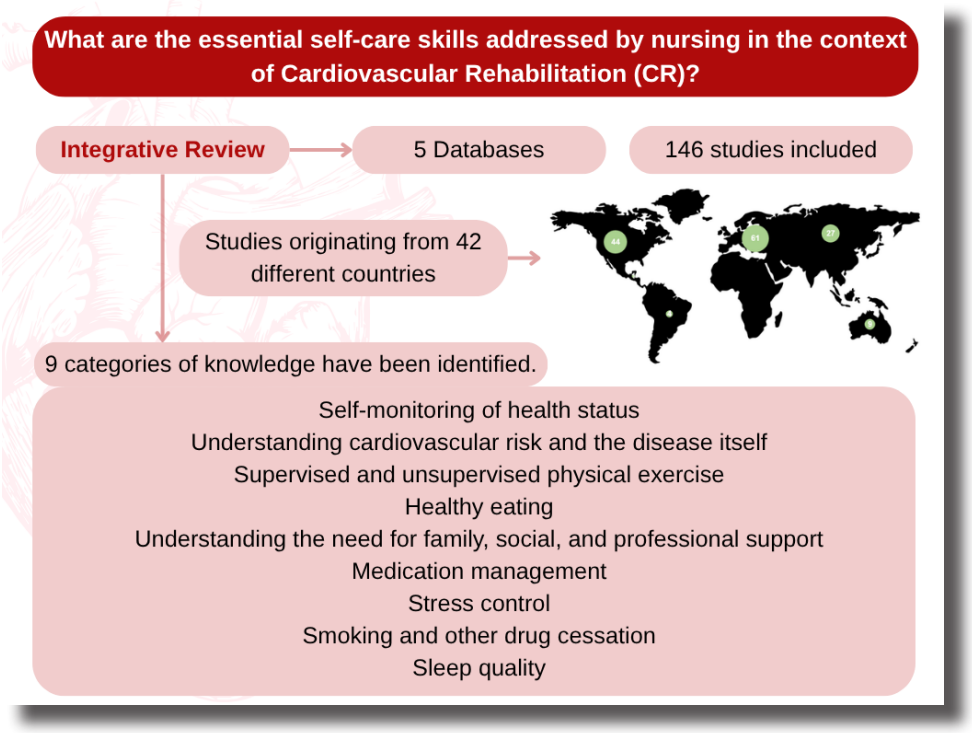
Highlights

- *Health status self-monitoring in CR is influenced by vital sign tracking and may be supported by digital technologies.*
- *Understanding of CR and one's own disease directly correlates with better clinical outcomes.*
- *Adherence to supervised and unsupervised physical exercise requires emotional and educational support.*
- *Healthy diet must be tailored to the clinical and socioeconomic profile of the person in CR.*
- *Successful CR requires, beyond structured clinical care, the integration of psychosocial factors that directly impact treatment adherence and self-care.*

Graphical Abstract



Abstract

Self-care in cardiovascular rehabilitation (CR) is an essential factor for promoting patient autonomy and is strongly influenced by the level of knowledge that patients possess. This study aimed to identify the essential self-care knowledge addressed by nursing in the context of CR. This is an integrative review conducted between April and September 2024, in six stages. Data collection was performed across five databases by two independent researchers. A total of 146 studies were selected, derived from research conducted in 42 different countries. The cardiovascular conditions most frequently addressed in the studies were heart failure, acute myocardial infarction, and coronary artery disease. Among the identified categories of essential knowledge are: health status self-monitoring; understanding of CR and one's own disease; supervised and unsupervised physical exercise; healthy diet; and understanding of the need for family, social, and professional support. The collected information may support the development of educational technologies or clinical approaches for the promotion of self-care in CR from a nursing perspective.

Keywords: Cardiology. Cardiovascular Nursing. Cardiac Rehabilitation. Self-Care. Health Literacy.

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INTRODUCTION

Cardiovascular diseases (CVDs) are responsible for the leading causes of death in Brazil. These conditions impact not only mortality and the reduction of life expectancy, but also patients' quality of life, sometimes leaving sequelae and disabilities that lead to reduced productivity and increased dependency for the performance of daily activities[1].

In this perspective, cardiovascular rehabilitation (CR) consists of a set of interventions focused on adaptation to the new lifestyle that individuals present after being affected by these pathologies. As such, rehabilitative therapy seeks to improve quality of life with a view to preventing new cardiovascular events, in addition to reducing mortality and morbidity. Furthermore, it stimulates social reintegration and restores independence[2].

Among the essential elements of CR are multiprofessional monitoring, the availability of multidimensional interventions, and the promotion of self-care[3]. In this regard, the need is highlighted for investment in therapeutic approaches aimed at promoting the individual capacity to perform actions that seek the preservation and maintenance of health, or to cope with disease and disability[4].

In this context, understanding the implications of CVDs on the mode of living, nursing care in CR is deemed necessary to ensure the autonomy of the person undergoing rehabilitation – self-care being an essential tool for achieving this purpose. It is therefore relevant to conduct a bibliographic survey in an attempt to gather evidence for the identification, analysis, and synthesis of nursing guidance needs for the self-care of these patients.

Thus, the objective of this study was to identify the essential knowledge for self-care addressed by nursing in the context of CR.

METHODOLOGY

This is an integrative review conducted between April and September 2024, in six stages[5]. To guide the conduct of the review, a research question was constructed using the Population, Interest, and Context (PICo) acronym, whereby Population = People in CR, Interest = Nursing in CR, and Context = Knowledge for self-care. The following research problem was thus formulated: "What is the essential knowledge for self-care addressed by nursing in the context of CR?"

For the construction of the search strategy, controlled descriptors from the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH) were used, aided by the Boolean operators "AND" and "OR". Table 1 presents the description of the process of developing the search strategy[6].

Table 1 - Development of the search strategy.

	P – Population	I – Interest	Co – Context
Extraction	People in cardiovascular rehabilitation	Nursing in Cardiovascular Rehabilitation	Knowledge for self-care
Conversion	*Cardiac Rehabilitation*	*Rehabilitation Nursing*	*Self Care*
Combination	*cardiac rehabilitation*	*rehabilitation nursing; cardiovascular nursing; cardiovascular diseases; nursing care*	*Self care*
Construction	*"cardiac rehabilitation"*	*"rehabilitation nursing" OR "cardiovascular nursing" OR "cardiovascular diseases" OR "nursing care"*	*"self care"*
Use	*cardiac rehabilitation AND ("rehabilitation nursing" OR "cardiovascular nursing" OR "cardiovascular diseases" OR "nursing care") AND "self care"*		

Source: Developed in accordance with the recommendations of Araújo[6]

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The bibliographic search was conducted on April 18, 2024, across the following databases, with no temporal or language restrictions: Medical Literature Analysis and Retrieval System Online via PubMed (MEDLINE/PubMed), MEDLINE via the Virtual Health Library (MEDLINE/BVS), Web of Science, Latin American and Caribbean Health Sciences Literature (LILACS), Nursing Database (BDENF), and Scientific Electronic Library Online (SCIELO). The search strategy was customized for each database, considering its particular indexing, syntax, and information retrieval characteristics, with the controlled descriptors presented in Table 1, in order to ensure conceptual equivalence of the search and broaden the identification of potentially relevant studies.

Upon applying the search strategy to the databases, documents were downloaded in RIS file format. Subsequently, the files were imported into Rayyan® software, which was used for reference management, duplicate identification, and support of the study screening process[7].

After removal of duplicate records, two independent reviewers read titles and abstracts to assess study eligibility. Original articles from primary research available in full text electronically were included. Review articles, editorials, letters to the editor, conference abstracts, research protocols, dissertations, theses, incomplete documents, and studies that did not address the guiding question were excluded.

Subsequently, potentially eligible studies were submitted to full-text reading by the same reviewers. Disagreements between reviewers were resolved by consensus and, when necessary, through assessment by a third researcher.

Data from the included studies were extracted using an instrument developed by the researchers and operationalized in a Microsoft Excel® spreadsheet. Information was collected regarding study identification (title, authors, year of publication, and country of conduct), methodological characteristics (design and study type), characteristics of the investigated population, and main findings related to self-care knowledge in the context of Nursing in CR. For the purposes of this review, "main findings" corresponded to the information presented by study authors that answered the guiding question.

The process of identification, screening, eligibility, and inclusion of studies was presented through a flowchart adapted from the PRISMA statement[8], used to provide transparency in the study selection process.

Data extracted from the included studies were subjected to comparative analysis and grouped by thematic similarity. From this process, analytical categories were constructed that synthesized the self-care knowledge addressed by nursing in the context of CR. Multiple coding of findings was adopted for the conception of such categories. Thus, a single study could contribute to more than one thematic category, since it frequently addressed different forms of knowledge related to self-care in CR.

RESULTS

The process of identification, screening, and inclusion of the articles evaluated in this review is presented in Figure 1.

The 146 included studies were published between 2000 and 2024, with 8.22% (n=12) published in the first decade of the millennium, 25.34% (n=37) between 2010 and 2014, 33.56% (n=49) between 2015 and 2019, and 32.19% (n=47) between 2020 and 2024.

Publications originated from 42 different countries. Figure 2 highlights the quantity by continents, according to the following categorization: North America, Central America, South America, Europe, Asia, and Oceania. No studies conducted on the African continent were identified.

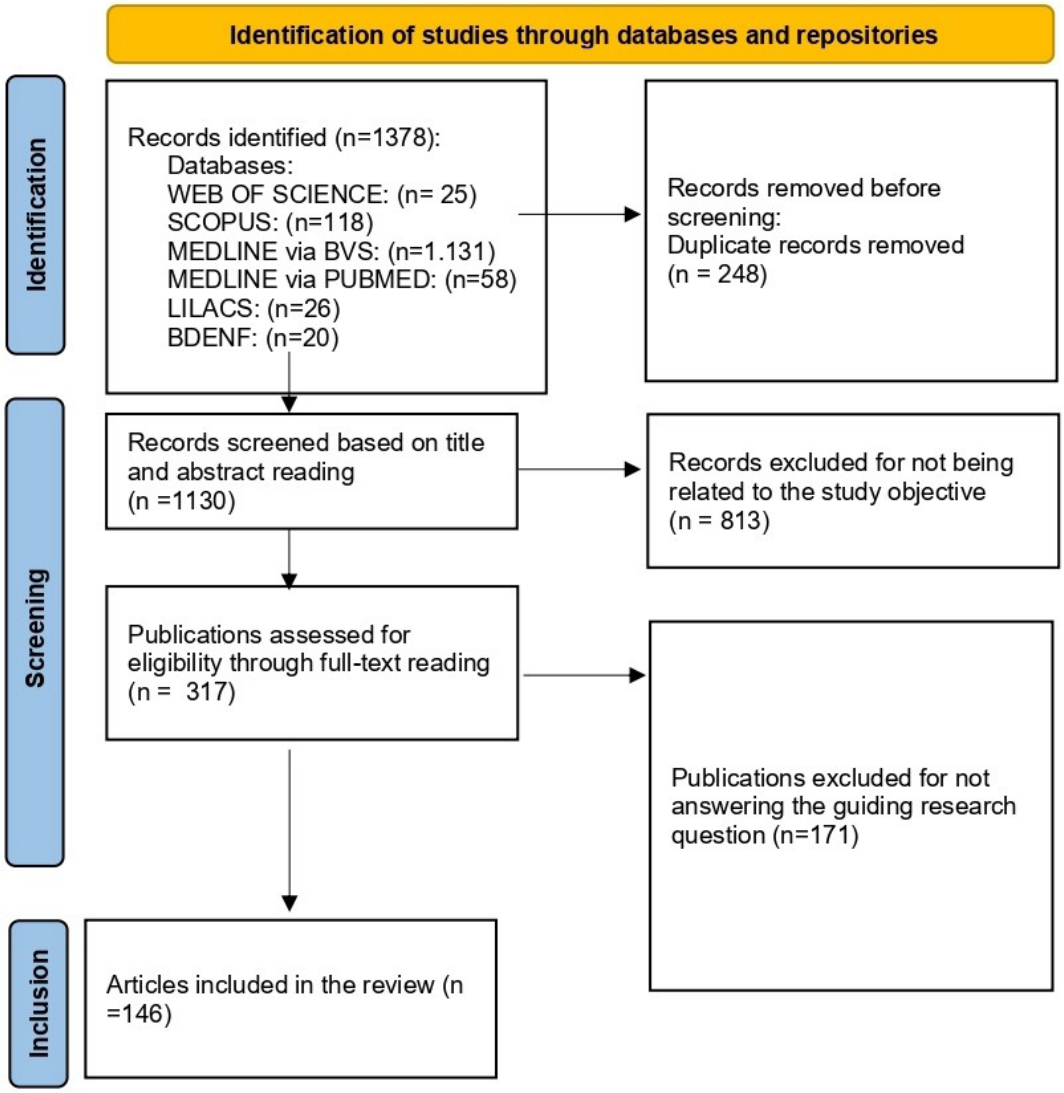

Figure 1 - PRISMA Flowchart.

Figure 2 - Distribution of included studies by continent.

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Regarding the evidence level (EL) of the 146 analyzed publications, 12.32% had EL I, 36.3% had EL II, 5.47% had EL III, 11.64% had EL IV, 10.27% had EL V, 21.23% had EL VI, and 2.73% had EL VII.

The cardiovascular conditions most frequently addressed were heart failure (38.36%; n=56), acute myocardial infarction (11.64%; n=17), and coronary artery disease (8.22%; n=12).

The 146 included studies resulted in 435 thematic occurrences related to the essential self-care knowledge addressed by nursing in the context of CR. Considering that a single study could address multiple types of knowledge, each article was counted in all pertinent categories within its content. Thus, nine themes emerged, as presented in Table 2.

Table 2 - Categorization of knowledge necessary for self-care addressed by Nursing in the context of CR. Fortaleza, Ceará, Brazil.

Categorization of knowledge necessary for self-care in CR	Number of studies with the theme	%
Health status self-monitoring	110	25.29%
Understanding of CR and one's own disease	83	19.08%
Supervised and unsupervised physical exercise	69	15.86%
Healthy diet	59	13.86%
Understanding of the need for family, social, and professional support	43	9.89%
Self-management of medication	28	6.44%
Stress management	24	5.52%
Smoking cessation and other substances	16	3.68%
Sleep quality	3	0.69%
Total	**435**	**100%**

DISCUSSION

Based on the analysis of the included studies, a significant increase in the number of publications over time was identified, with a growth of 391% when comparing the first five years of the millennium with the period 2020–2024. This advance reflects the prioritization of CR in global guidelines and the adoption of digital technologies, as evidenced by interventions with remote support and the use of mobile applications for self-management in CR[9,10,11].

Regarding the geographic distribution of scientific production, marked disparities were observed, with approximately 86% of studies conducted in high-income countries, while only 14% originate from low- and middle-income nations. This asymmetry reflects inequalities in research funding and infrastructure on the subject. Such findings underscore the urgent need for global initiatives promoting equity in knowledge generation on CR, given that CVDs are responsible for approximately 32% of global deaths, with a disproportionately larger burden in developing countries, where approximately 80% of cases occur[12].

Nine thematic categories of knowledge necessary for self-care in CR were identified, which are aligned with global guidelines[13,14].

The most predominant category in the publications (n=110; 25.29%) concerns health status self-monitoring. Self-monitoring of physiological parameters – such as blood pressure, heart rate, and body weight – constitutes a fundamental strategy in the prevention of cardiovascular decompensations, enabling early identification of signs of clinical exacerbation and allowing timely therapeutic interventions[15].

Integration of mobile applications into self-monitoring also demonstrates a positive impact. The PACT-HF program (Personalized Alerting and Contactless Telemonitoring for Heart Failure), for example, evidenced a 40% increase in self-care adherence through the use of Bluetooth-connected devices and personalized feedback systems, optimizing symptom and therapeutic management[16]. In this context, personalized telemonitoring promoted significant improvement in self-care adherence and in the reduction of hospitalizations in patients with heart failure. These technologies enable patients to monitor their condition in real time and adjust their behavior according to their specific needs[17].

Even more striking results were observed by Kokkonen[18], in which the incorporation of telemonitoring into conventional care reduced by 70% the proportion of patients with ≥1 hospitalization for heart failure. These findings corroborate the premise that self-monitoring strategies can mitigate adverse events and hospital readmissions.

The need for understanding of CR and one's own disease was the second most evidenced category in the analyzed publications. It was found that health literacy directly correlates with better clinical outcomes. Patients who received structured education about their clinical condition demonstrated greater knowledge retention, showing that organized and adapted educational interventions – with simplified language and interactive methods – enhance comprehension and retention of information essential for self-care[19]. It is notable that investing in structured education and in strategies to improve health literacy is crucial for optimizing the management of heart disease. Effective educational interventions can transform knowledge into action, reducing complications and healthcare costs[19].

Supervised and unsupervised physical exercise, in turn, is one of the most studied interventions in CR, being the third most discussed category in the analyzed publications. Studies such as HF-ACTION[20] demonstrated that supervised aerobic training significantly improves functional status and reduces hospitalizations in patients with chronic heart failure. Home-based programs with technological support and other telemonitoring-based approaches demonstrated similar benefits in terms of functional capacity and adherence, constituting viable alternatives for patients at mild-to-moderate risk[21]. Furthermore, a meta-analysis conducted by Anderson[22] confirmed that home-based programs are effective and safe when well-structured.

Regular physical training reduces cardiovascular mortality by approximately 20–30%, as demonstrated by various meta-analyses and European Society of Cardiology guidelines, which highlight the positive impact of exercise-based rehabilitation on relevant clinical outcomes[22,23]. Therefore, for patient adherence to these therapies, it is essential that they understand their relevance, thereby fostering responsibility for adherence to and continuity of treatment.

In this regard, adherence to physical exercise remains a challenge. Research[24] demonstrates that interventions based on motivational interviewing and psychological support can increase adherence to exercise programs, especially in patients with heart failure. This suggests that, beyond exercise prescription, it is crucial to provide continuous emotional and educational support to ensure the maintenance of healthy habits.

In the context of CR, healthy diet consolidates as an essential pillar of self-care and secondary prevention of heart disease. Evidence suggests that individualized nutritional interventions can positively impact various clinical outcomes. In the study by Heidenreich[15], the application of an individualized dietary plan, combined with continuous nutritional monitoring, was associated with significant improvement in mood, physical function, and quality of life in hospitalized elderly patients with chronic heart failure.

Among the recommended dietary patterns, the Mediterranean diet has stood out for its robust association with the reduction of cardiovascular events. Characterized by high intake of olive oil, fruits, vegetables, whole grains, fish, and nuts, this approach was evaluated in a study that demonstrated an approximately 31% reduction in the risk of myocardial infarction, stroke, and cardiovascular death[25].

Another relevant aspect of dietary guidance is orientation regarding sodium consumption control. Sodium restriction has traditionally been used as a strategy to mitigate congestive symptoms and reduce hospitalizations. Recent guidelines and systematic reviews, such as those of Heidenreich[15], reinforce that moderate restriction can attenuate edema and symptoms, although risks of malnutrition in vulnerable patients must be considered.

Thus, dietary guidance in the context of CR should be adapted to the patient's clinical, nutritional, and socioeconomic profile, focusing on evidence-based dietary patterns – such as the Mediterranean diet and judicious sodium control – always accompanied by qualified professionals.

Successful CR requires, beyond structured clinical care, the integration of psychosocial factors that directly impact treatment adherence and self-care. In this context, family, social, and professional support plays a determining role in the continuity of healthy practices and in the empowerment of the patient regarding their own condition.

Structured interventions incorporating social support and problem-solving strategies proved effective in promoting self-care in patients with heart failure. In the study by Graven[26], it was observed that the strengthening of self-perception, combined with family support and continuous education, was decisive for improved treatment adherence and symptom management – evidencing the role of social support as an essential facilitator in cardiovascular rehabilitation.

Family involvement also proved relevant: patients who had structured family support maintained higher levels of physical activity after discharge from rehabilitation[27], reinforcing the importance of continued support after the conclusion of the supervised phase of rehabilitation.

Regarding professional support, the qualified involvement of the health team – including nurses,

physicians, physiotherapists, and other professionals – has been recognized by patients as essential for treatment adherence. An Israeli study[28] showed that the presence of an available, empathic, and clear rehabilitation team in its guidance was decisive for patients' continuation in self-care programs after myocardial infarction.

Furthermore, a study[29] conducted in Germany, involving a team-based integrated care program with health professionals, demonstrated a significant improvement in self-care indicators and control of risk factors in patients with coronary artery disease and psychosocial distress. The intervention was based on progressive therapeutic plans, digital support, and continuous monitoring – evidencing the central role of collaborative management in therapeutic adherence.

Similarly, the clinical trial conducted by Spall[30] tested a patient-centered transitional care model for heart failure patients, coordinated by a multiprofessional team comprising nurses, physicians, and other healthcare professionals. Results indicated improvement in medication adherence, early symptom recognition, and quality of life. Thus, both studies demonstrate that coordinated action across different areas of care is essential for the optimization of clinical outcomes in CR.

Additionally, adequate pharmacotherapy management constitutes one of the fundamental pillars of CR, with medication regimen adherence being strongly associated with reduced hospitalizations and mortality in patients with heart disease. However, evidence demonstrates that the presence of persistent depressive symptoms significantly compromises such adherence[31].

Research[31] indicated that patients with depressive symptoms maintained from hospitalization through three months post-discharge showed lower engagement in secondary prevention behaviors – including smoking cessation, regular physical activity practice, participation in rehabilitation programs, and notably, continuous medication use. These findings underscore the importance of recognizing and adequately treating depression in this patient group, since compromised therapeutic adherence may decisively contribute to increased morbimortality following acute cardiovascular events.

A systematic review with meta-analysis conducted by Al-Arkee[32] investigated the efficacy of mobile health applications in medication adherence in patients with CVDs. The analysis included 16 randomized clinical trials, of which nine demonstrated statistically significant improvement in medication adherence among patients who used applications compared to the control group. Furthermore, a positive trend was observed in clinical outcomes such as blood pressure and cholesterol levels. Most applications combined features such as reminders and educational support, and usability was considered satisfactory by participants.

Health education aimed at promoting self-care proved effective in improving adherence to pharmacological treatment among patients with heart failure[33]. According to the authors, structured educational interventions resulted in a significant increase in self-care levels and greater engagement with the prescribed therapeutic regimen. These findings reinforce the relevance of strategies that empower patients to understand and manage their clinical condition, favoring more conscious and sustained therapeutic decisions.

Complementarily, a post-infarction digital education program, culturally adapted to the context of Iranian patients, demonstrated positive effects on treatment adherence – including adequate medication use[16]. Thus, health literacy, disease knowledge, and the empathic performance of professionals are central elements for promoting sustainable medication use behaviors[34].

Studies[35,36,37] further suggest that stress management contributes significantly to treatment adherence, quality of life improvement, and continued engagement with protective behaviors, indirectly impacting the prevention of adverse outcomes in CR. The analyzed studies indicate that psychosocial interventions, emotional education, technology use, and patient-centered strategies are effective tools for mitigating stress and promoting self-care.

Following acute myocardial infarction, patients frequently experience chronic stress related to uncertainty about the future, fear of recurrence, and abrupt lifestyle changes. However, yoga-based rehabilitation promoted relaxation and improvement of self-rated health, proving effective in reducing emotional stress after AMI[36].

Complementarily, the study by Boyde[38] identified that hospitalization for AMI represents a critical learning moment, in which patients reported greater awareness of risk factors and the relationship between emotional stress and cardiovascular symptoms – reinforcing the importance of structured education in the post-discharge period.

On the other hand, smoking and alcohol cessation is one of the most relevant goals for self-care in CR, being associated with reduced mortality, improved endothelial function, and fewer recurrent cardiovascular events. To achieve these objectives, effective interventions combine therapeutic education, psychosocial support, technology use, and individualized approaches[39,40,41].

Structured therapeutic education is an essential tool for promoting behavioral change, as it improves patients' knowledge of risks associated with smoking and alcohol and provides practical strategies for abandoning such substances[39]. When implemented systematically in the cardiology unit routine – as demonstrated by a European hospital program – this education facilitates patient understanding and motivation, directly impacting smoking and substance cessation[40].

The use of mobile technologies – such as sending personalized and educational text messages – has proven to be an effective strategy for reinforcing healthy habits and supporting substance abandonment. Patients who received motivational and informative messages via mobile phone reported greater engagement with secondary prevention behaviors, including smoking cessation[41].

Technology was also effective when combined with progress monitoring and provision of personalized feedback, as observed in an intervention with digital rehabilitation combined with in-person support, which demonstrated improvement in substance-related habits[11].

The presence of active social and family networks plays an important protective role, favoring smoking cessation and the maintenance of healthy behaviors. Patients with stronger social connections showed greater adherence to self-care recommendations, including tobacco use cessation[42]. On the other hand, the absence of consistent support or ambiguous messages from the healthcare team can generate frustration and demotivation, especially in settings with less structure, such as rural community programs[43].

Mental health is another determining factor. Patients with persistent depression following acute cardiovascular events demonstrate lower capacity to adhere to smoking cessation strategies, with higher risk of relapse and program dropout. The presence of untreated depressive symptoms compromises motivation, reduces self-confidence, and hinders coping with stress related to abandoning harmful habits[31].

Regarding sleep quality, this component is frequently neglected, yet essential in CR. Patients who undergo cardiac surgery present important alterations in sleep architecture, including episodes of insomnia and excessive daytime sleepiness. Such disturbances contribute to worsening of functional status and cardiovascular outcomes, indicating that the assessment and treatment of sleep problems should be incorporated into CR routine[44].

Poor sleep quality is associated with lower adherence to behavioral interventions and worse control of risk factors. The use of continuous monitoring technologies enabled patients to receive feedback on their sleep hygiene, promoting greater awareness of the impact of inadequate rest on cardiac health[35].

From the perspective of humanized and individualized care, the case report by Frota[45] showed that sleep disturbances are among the main vulnerabilities perceived by patients in CR. The study recommends that healthcare professionals be attentive to sleep-related complaints and incorporate active listening, sleep hygiene guidance, and relaxation techniques into the therapeutic plan.

Thus, although the nine identified thematic categories were broadly represented in the included studies, heterogeneity was observed regarding application contexts, investigated populations, and strategies used to promote self-care. While some studies emphasized knowledge related to self-monitoring and disease management[15,17,19], others focused on behavioral[22,23,39,40,41], psychosocial[24,26,27,31,35,36,37], or educational[16,33] aspects. This variability demonstrates that self-care in CR is a multifaceted phenomenon, influenced by clinical, social, and organizational factors, with no consensus on which knowledge should be prioritized at all stages of rehabilitation.

Another relevant aspect pertains to the predominance of studies conducted in high-income countries and in structured CR services[22,24,29,30]. This characteristic limits the understanding of the applicability of the identified knowledge in settings with fewer available resources, especially in low- and middle-income countries. Furthermore, methodological diversity was observed among the included studies – encompassing different designs and objectives – which hinders direct comparisons between findings and reinforces the need for caution in generalizing the results.

Finally, the results of this review evidence that self-care knowledge in CR transcends the simple transmission of information, involving understanding of the disease, the treatment, and the changes necessary for the management of cardiovascular conditions. However, gaps persist related to the standardization of educational content, the assessment of knowledge retention over time, and the adaptation of educational strategies to different sociocultural contexts. Future investigations should therefore seek greater depth into which knowledge is most relevant for different patient profiles and how it can be effectively incorporated into nursing practices in cardiovascular rehabilitation.

CONCLUSION

This integrative review identified nine categories of knowledge for self-care addressed by nursing in the context of CR: health status self-monitoring; understanding of CR and one's own disease; physical exercise; healthy diet; understanding of the need for family, social, and professional support; self-management of medication; stress management; smoking and substance cessation; and sleep quality. Among them, health status self-monitoring and understanding of the disease and the CR process stood out, as they presented the highest frequency in the analyzed studies.

The findings reinforce the importance of health education as a strategy to support the development of knowledge that favors self-care during CR. Nursing, in turn, plays a central role in this process – through the identification of patients' learning needs and the implementation of educational interventions that promote autonomy, treatment engagement, and the adoption of healthy behaviors.

As study limitations, the absence of formal assessment of the methodological quality of the included studies and the inherent restrictions of the adopted search strategy stand out. These aspects should be considered in the interpretation of results, as they may influence the comprehensiveness of the identified knowledge and the generalization of findings to different care contexts.

CRediT author statement

Conceptualization: Alves, HO; Frota, KC. Methodology: Alves, HO; Frota, KC. Validation: Frota, KC. Statistical Analysis: Alves, HO. Formal Analysis: Alves, HO. Investigation: Alves, HO; Portela, RRP; Oliveira, KMS. Resources: Alves, HO; Frota, KC. Writing – Original Draft Preparation: Alves, HO; Portela, RRP; Oliveira, KMS. Writing – Review & Editing: Alves, HO; Frota, KC; Silva, LF; Ponte, KMA. Visualization: Alves, HO; Oliveira, KMS. Supervision: Frota, KC; Silva, LF; Oliveira, KMS. Project Administration: Frota, KC.

All authors have read and agreed to the published version of the manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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