Aquichan
ISSN: 1657-5997
ISSN: 2027-5374
Universidad de La Sabana

Lima, Alcides Viana de; Silva, Breno Wagner Araújo Cosme da; Melo, Vivianne Lima de; Silva, José Adailton da; Costa, Isabelle Katherinne Fernandes

Learning Needs and Educational Strategies for Adult Patients in the Preoperative Period of Myocardial Revascularization: Scoping Review*

Aquichan, vol. 22, no. 3, e2237, 2022, July-September
Universidad de La Sabana

DOI: https://doi.org/10.5294/aqui.2022.22.3.7

Available in: https://www.redalyc.org/articulo.oa?id=74172631007

Artículo

Learning Needs and Educational Strategies for Adult Patients in the Preoperative Period of Myocardial Revascularization: Scoping Review*

* This article derives from the dissertation entitled "*Mobile app* para auxilio en la educación del paciente en el preoperatorio de revascularización miocárdica" submitted to the Nursing Graduate Program at the Federal University of Rio Grande do Norte, Brazil.

✉ ***Alcides Viana de Lima Neto***
https://orcid.org/0000-0001-6191-9465
Universidade Federal do Rio Grande do Norte, Brazil
alcides.viana.066@ufrn.edu.br

Breno Wagner Araújo Cosme da Silva
https://orcid.org/0000-0001-7240-4408
Universidade Federal do Rio Grande do Norte, Brazil
breno.araujo.072@ufrn.edu.br

Vivianne Lima de Melo
https://orcid.org/0000-0002-6792-3462
Universidade Federal do Rio Grande do Norte, Brazil
vivia1999@ufrn.edu.br

José Adailton da Silva
https://orcid.org/0000-0002-6037-7649
Universidade Federal do Rio Grande do Norte, Brazil
adailton.silva@ufrn.br

Isabelle Katherinne Fernandes Costa
https://orcid.org/0000-0002-1476-8702
Universidade Federal do Rio Grande do Norte, Brazil
isabelle.fernandes@ufrn.br

Recebido: 25/08/2021
Submetido a pares: 24/01/2022
Aceito por pares: 10/03/2022
Aprovado: 15/03/2022

DOI: 10.5294/aqui.2022.22.3.7

Para citar este artículo / To reference this article / Para citar este artigo
Lima Neto AV, Silva BWAC, Melo VL, Silva JA, Costa IKF. Learning Needs and Educational Strategies for Adult Patients in the Preoperative Period of Myocardial Revascularization: Scoping Review. Aquichan. 2022;22(3):e2237. DOI: https://doi.org/10.5294/aqui.2022.22.3.7

Theme: Evidence-based practice.

Contribution for the discipline: The present study may help the nursing and/or health team in planning and implementing health orientation and education programs for adult patients who will undergo coronary artery bypass graft surgery based on scientific evidence. In this way, better clinical results can be achieved after surgical intervention.

Abstract

Objective: To identify and map learning needs and educational strategies for adult patients in the preoperative period of myocardial revascularization. **Materials and method:** Scoping review conducted between March and April 2021 in national and international databases to identify records published in scientific journals and gray literature, without period. **Results:** The selected sample consisted of 35 records, composed mostly of articles (32; 91.42 %) published from 1990 to 2021. The learning needs of patients before surgery were categorized into cardiovascular system and coronary artery disease; procedures and routines before, during, and after surgery. In addition, several educational strategies implemented in the studies were identified. **Conclusions:** The learning needs identified can contribute to planning and implementing patient-centered educational strategies before surgery.

Keywords (Source: DeCS)
Preoperative period; patient education; myocardial revascularization; patient care team; nursing.

Necesidades de aprendizaje y estrategias educativas para pacientes adultos en preoperatorio de revascularización miocárdica: *scoping review**

* Artículo derivado de la tesis de doctorado titulada "***Mobile app*** para auxilio en la educación del paciente en el preoperatorio de revascularización miocárdica", presentada al Programa de Posgrado en Enfermería de la Universidade Federal do Rio Grande do Norte, Brasil.

Resumen

Objetivo: identificar y mapear las necesidades de aprendizaje y estrategias educativas para pacientes adultos en el preoperatorio de revascularización miocárdica. **Materiales y método:** *scoping review* realizada entre marzo y abril de 2021 en bases de datos nacionales e internacionales para identificar registros publicados en periódicos científicos y en la literatura gris, sin recorte temporal. **Resultados**: la muestra se conformó de 35 registros, de los cuales 32 fueron artículos (91,42%) publicados entre 1990 y 2021. Las necesidades de aprendizaje de los pacientes antes de la cirugía se categorizaron en sistema cardiovascular y enfermedad de las arterias coronarias; cuidados, procedimientos y rutinas antes, durante y después de la cirugía. Además, se identificaron diversas estrategias educativas implementadas en los diferentes contextos de los estudios. **Conclusiones:** las necesidades de aprendizaje identificadas pueden aportar a la planeación e implementación de estrategias educativas enfocadas en el paciente antes de la realización de la cirugía.

Palabras clave (Fuente: DeCS)
Periodo preoperatorio; educación del paciente; revascularización miocárdica; grupo de atención al paciente; enfermería.

Necessidades de aprendizagem e estratégias educacionais para pacientes adultos no pré-operatório de revascularização do miocárdio: *scoping review**

* Este artigo é derivado da tese de doutorado intitulada "***Mobile app*** para auxílio na educação do paciente no pré-operatório de revascularização do miocárdio", submetida ao Programa de Pós-Graduação em Enfermagem da Universidade Federal do Rio Grande do Norte, Brasil.

Resumo

Objetivo: identificar e mapear as necessidades de aprendizagem e estratégias educacionais para pacientes adultos no pré-operatório de revascularização do miocárdio. **Materiais e método:** *scoping review* realizada entre março e abril de 2021, em bases de dados nacionais e internacionais para identificar registros publicados em periódicos científicos e na literatura cinzenta, sem recorte temporal. **Resultados**: a amostra selecionada foi de 35 registros, compostos, em sua maioria, de artigos (32; 91,42%), publicados de 1990 a 2021. As necessidades de aprendizagem dos pacientes antes da cirurgia foram categorizadas em sistema cardiovascular e doença arterial coronariana; cuidados, procedimentos e rotinas antes, durante e após a cirurgia. Além disso, identificaram-se diversas estratégias educacionais implementadas nos diferentes contextos dos estudos. **Conclusões:** as necessidades de aprendizagem identificadas podem contribuir para o planejamento e a implementação de estratégias educacionais centradas no paciente antes da realização da cirurgia.

Palavras-chave (Fonte: DeCS)
Período pré-operatório; educação do paciente; revascularização miocárdica; equipe de saúde; enfermagem.

Introduction

Cardiovascular diseases (CVD) are the leading cause of death worldwide, with an estimated 17.9 million lives each year. They represent a group of diseases of the heart and blood vessels that include coronary artery disease (CAD) and other conditions (1).

CAD is caused by the accumulation of plaques formed by deposits of cholesterol and other substances on the walls of the coronary arteries, which provide blood to the heart and other parts of the body. This accumulation causes the interior of the arteries to narrow over time, which can partially or totally block blood flow (2).

Therefore, the identification of individuals at higher risk for developing diseases such as CAD and the guarantee of appropriate treatment can avoid consequences such as premature deaths. Therefore, access to essential medicines and health technologies is important (3).

Thus, among the treatments for this condition is myocardial revascularization surgery (MRS), also known as "saphenous bridge" or "breast". It is performed when drug and other alternatives are not sufficient to restore coronary blood supply, and enables proven long-term survival benefits (3,4).

However, MRS can be considered a stressful event for patients due to physical factors, such as pain, and psychological factors such as anxiety, fear, and depression. This can be caused by thoughts of uncertainty about survival, the risks of complications, the environment of the intensive care unit (ICU), in addition to concerns about the postoperative care process and the resumption of routine activities. Therefore, the physical and mental well-being of the individual can be impaired and negatively influence the outcome of treatment and the evolution of the postoperative period (5).

Therefore, identifying the patient's learning needs about surgery and how he/she faces and deals with the preoperative period is an important aspect for the multidisciplinary team that assists him/her to identify risk factors. It can be done through educational activities, in which the health professional must also understand the patient's previous knowledge and follow the appropriate orientations, according to their particularities and using an accessible language. This can create and strengthen the bond, contribute to better clinical results, and reduce hospitalization time, care-related infections, and other postoperative complications (6).

Thus, educational interventions with resources such as images, audio and video are important facilitating tools for the multidisciplinary team. They can contribute to a better understanding of patients about their health condition and the procedures and conducts adopted in the pre- trans- and postoperative phases of surgery, and help establish a relationship of trust and learning between the patient and the professional (5).

Thus, prior to the elaboration of the research protocol on this theme, a search was conducted in national and international databases. No similar study was found, which justifies the realization of this scoping review. Therefore, the objective is to identify and map learning needs and educational strategies for adult patients in the preoperative period of MRS.

Materials and method

This scoping review followed the reference proposed by the Joanna Briggs Institute (JBI), which allows mapping the main concepts, clarifying research areas, and identifying knowledge gaps (7). For formulating the research question, the mnemonic strategy population, concept, and context were used. With this, the following were defined: population (P) — adult patients; concept (C) — learning needs and educational strategies; context (C) — preoperative care for MRS in hospitals. Thus, based on these definitions, the guiding question was outlined: what learning needs and educational strategies are used preoperatively for adult patients of MRS in hospitals?

For conducting the study, a protocol entitled "learning needs and educational strategies for adult patients in the preoperative period of MRS": was prepared, according to JBI recommendations. This protocol is registered and available for consultation on the Open Science Framework (OSF), through the digital object identifier system (DOI): 10.17605/OSF. IO/2PBEM, which can be accessed at: https://osf.io/2pbem/.

Initially, through random keywords related to the theme, a search was conducted to build a bank of terms. At this stage, we consulted the basis of the descriptors in health sciences (DECS) and identified the terms in Portuguese for each item of the mnemonic: P — "*paciente*"; C — "*aprendizagem e estratégias*"; C — "*cuidados pré-operatórios*", "*unidades de terapia intensiva*", "*enfermarias*", "*unidades de cuidados coronarianos*". In addition to the DECS platform, the search was conducted at The Cumulative Index to Nursing and Allied Health Literature (CINAHL) and the National Library of Medicine (PubMed) databases to identify the Medical Subject Headings (MeSH): P — "patient"; "patients"; "client"; "clients"; C — "patient education"; "health education"; "education"; "educational activities"; C — "preoperative period"; "perioperative care"; "myocardial revascularization"; "internal mammary artery implantation"; "coronary artery bypass"; "coronary artery surgery"; "hospital"; "intensive care unit"; "coronary care units"; "inpatients"; "hospitalization".

As eligibility criteria, texts available in full, in any language, without time limits and addressing learning needs and/or educational strategies for adult patients in the preoperative period of MRS were adopted. Opinion articles and texts not available in full were excluded.

Subsequently, with the terms, searches were conducted in pairs of scientific production, according to the eligibility criteria in March and April 2021 in the databases PubMed, CINAHL, Web of Science, Scopus, Latin American and Caribbean Health Sciences Literature (LILACS), The Cochrane Library, and Embase. The restricted databases were accessed through a resource of the Federated Academic Community, available to students, professors, and other public workers of Brazilian institutions.

The grey literature consulted were the Catalogue of Theses and Dissertations of the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*, the DART-Europe E-Theses portal, Electronic Theses Online Service, the *Repositório Científico de Acesso Aberto de Portugal*, the National Library of Australia (Trove), the National ETD Portal, the Education Resources Information Center, and Theses Canada.

The search strategy with the MeSH was used in an adapted way, according to the specific fields in each database and Boolean operators: "patient" OR "client" AND "patient education" OR "health education" OR "learning needs" OR "learning" OR "active learning" OR "educational needs assessment" AND "preoperative period" OR "perioperative care" AND "myocardial revascularization" OR "internal mammary artery implantation" OR "coronary artery bypass graft surgery" OR "coronary artery surgery" AND "hospital" OR "intensive care unit" OR "coronary care units" OR "inpatients" OR "hospitalization".

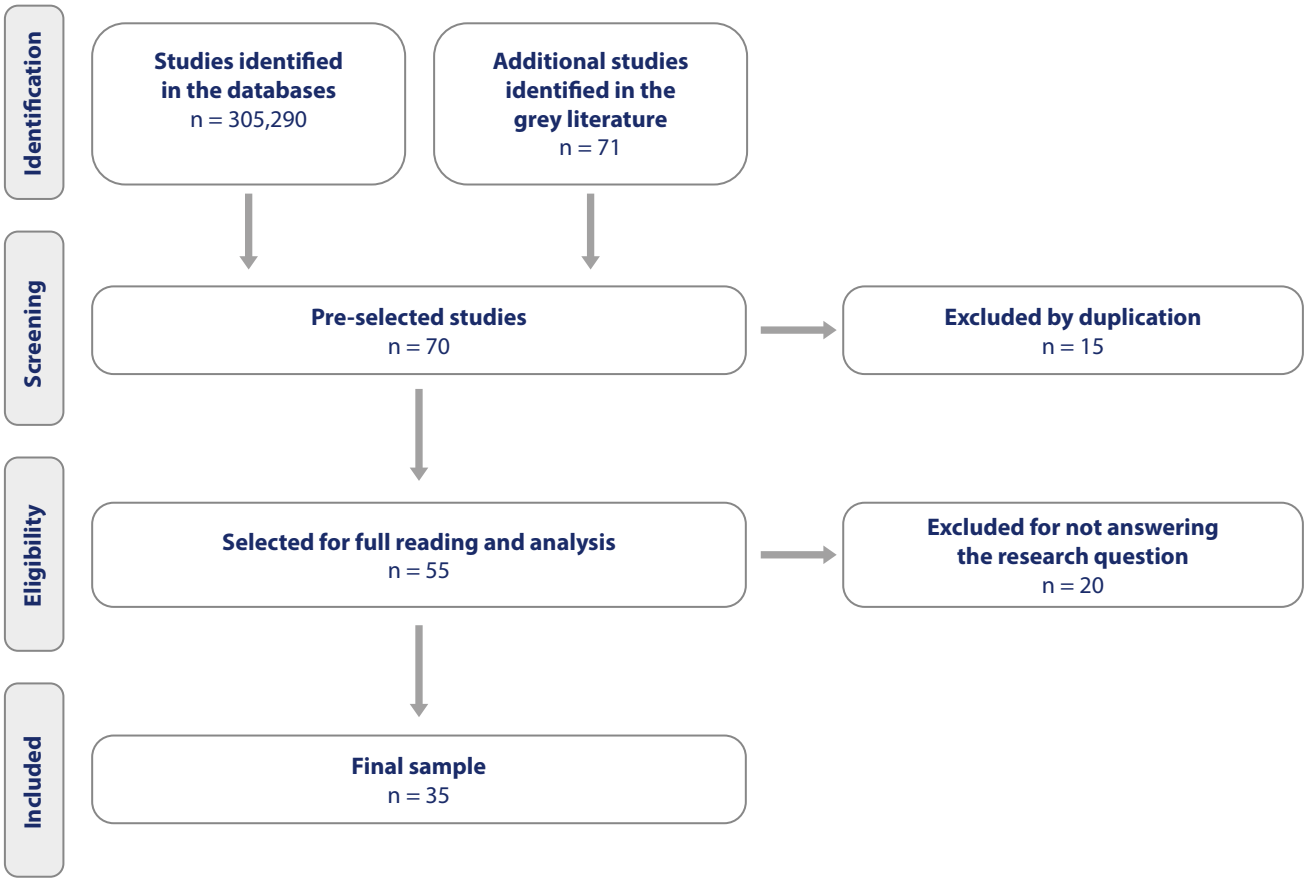
First, the titles and abstracts of the documents retrieved were read to fill out a location spreadsheet. Next, these documents were analyzed in full for inclusion in the review, according to the criteria of eligibility and extraction of the data in a spreadsheet in the Microsoft Excel® software to create a database.

The following variables were analyzed by simple descriptive statistics: type of document (article, thesis, dissertation, or other); year of publication; journal or higher education institution (HEIs); country of origin; language in which it was published; type of study; approach; level of evidence according to JBI classification (8); sample/participants; person responsible for the implementation of educational strategies; unit where it was implemented; period of the educational strategy; duration of the intervention; age; gender, and educational level of the participants. Regarding the learning needs and educational strategies used, methods and resources, a thematic categorization was carried out. The results are made available descriptively, as charts and tables.

Results

From the searches performed, 305,361 records were identified in the databases, of which 35 studies were included in the final sample. This process is illustrated in Figure 1.

Figure 1. Prisma flowchart of the scoping review. Natal, Rio Grande do Norte, Brazil, 2021



Source: Own elaboration following JBI recommendations (7).

The selected sample (n = 35) consists of 32 articles (91.42 %), a doctoral dissertation (2.86 %), a master's thesis (2.86 %), and an academic project (2.86 %). It has records from 1990 to 2021, whose year with the highest number was 2019, with four studies (11.43 %). The predominant countries were the United States and Germany, with five studies each (14.29 %), and the most frequent language was English, with 31 records (88.57 %).

Regarding methodological characterization, 16 randomized clinical trials (45.70 %), 28 quantitative studies (80 %) and 16 clinical trials belonging to evidence level 1C (45.70 %) stood out. Table 1 presents the detailed characterization of the studies according to journal or HEIs, year of publication, design of the study-approach-level of evidence and country of origin.

Table 1. Detailed characterization of the studies analyzed according to journal or HEI, year of publication, study design-approach-level of evidence and country of origin. Natal, Rio Grande do Norte, Brazil, 2021

Study	Journal or HEI	Year	Study design-approach-level of evidence	Country of origin
A1 (9)	Social Science & Medicine	1990	Prospective-quantitative-3E	United States of America
A2 (10)	Journal of Advanced Nursing	1990	Experimental-quantitative-2C	United States of America
A3 (11)	Annals of Behavioral Medicine	1998	Experimental-quantitative-2C	United States of America

Study	Journal or HEI	Year	Study design-approach-level of evidence	Country of origin
A4 (12)	Annals of Internal Medicine	2000	Randomized clinical trial-quantitative-1C	Canada
A5 (13)	Patient Education and Counseling	2001	Narrative-qualitative review-WE*	United Kingdom
A6 (14)	European Heart Journal	2002	Randomized clinical trial-quantitative-1C	United Kingdom
A7 (15)	International Association for the Study of Pain	2004	Randomized clinical trial-quantitative-1C	Canada
A8 (16)	Journal of Cardiac, Thoracic and Vascular Surgery	2005	Methodological-quantitative-WE*	Germany
A9 (17)	Journal of Cardiovascular Nursing	2006	Narrative-qualitative review-WE*	United States of America
A10 (18)	Schmerz	2006	Randomized clinical trial-quantitative-1C	Germany
A11 (19)	Patient Education and Counseling	2007	Randomized clinical trial-quantitative-1C	Norway
A12 (20)	Rehabilitation	2008	Longitudinal-quantitative study- 3E	Germany
A13 (21)	Thoracic Cardiovascular Surgery	2009	Cross-sectional-quantitative study-3E	Germany
A14 (22)	International Journal of Nursing Terminologies and Classifications	2010	Cross-sectional-quantitative study-3E	Brazil
A15 (23)	Pakistan Journal of Medical Sciences	2010	Quasi-experimental-quantitative- study-2C	Turkey
A16 (24)	Journal of Cardiovascular Nursing	2012	Randomized clinical trial-quantitative-1C	China
A17 (25)	The International Journal of Psychiatry in Medicine	2013	Retrospective-quantitative study-3E	South Korea
A18 (26)	European Journal of Cardiovascular Nursing	2014	Integrative-mixed-WE review*	Canada
A19 (27)	British Association of Critical Care Nurses	2014	Randomized clinical trial-quantitative-1C	Iran
A20 (28)	Turkish Journal of Thoracic and Cardiovascular Surgery	2014	Randomized clinical trial-quantitative-1C	Turkey
A21 (29)	European Journal of Cardiovascular Nursing	2015	Randomized clinical trial-quantitative-1C	Denmark
A22 (30)	BMJ Open	2016	Randomized clinical trial-quantitative-1C	China
A23 (6)	Journal of Clinical Nursing	2017	Critical literature review-qualitative-WE*	United Kingdom
A24 (31)	Kardiologia Polska	2018	Exploratory-qualitative-3E	Poland
A25 (32)	Critical Care Nursing	2018	Randomized clinical trial-quantitative-1C	Iran
A26 (33)	Nursing Critical Care	2019	Qualitative-4D case study	Uninformed
A27 (34)	ARYA Atherosclerosis	2019	Randomized clinical trial-quantitative-1C	Iran
A28 (3)	Patient Education and Counseling	2019	Randomized clinical trial-quantitative-1C	Iran
A29 (35)	Journal of Rehabilitation Medicine	2019	Randomized clinical trial-quantitative-1C	Denmark
A30 (36)	Current Cardiology Reports	2020	Narrative-qualitative review-SE*	Germany
A31 (4)	Complementary Therapies in Clinical Practice	2020	Randomized clinical trial-quantitative-1C	India
A32 (5)	BMJ Quality & Safety	2021	Randomized clinical trial-quantitative-1C	China
D1 (37)	University of Kwazulu Natal	2002	Cross-sectional-quantitative study-3E	United Arab Emirates
T1 (38)	*Universidade de São Paulo*	2007	Methodological-quantitative-WE*	Brazil
P1 (39)	University of Maryland School of Nursing	2017	Methodological-quantitative-WE*	United States of America

*WE: without level of evidence according to JBI classification.

Source: Own elaboration.

The identified records that came from research with humans showed a sample variation from 1 to 745 individuals, with mean ages from 54.9 to 68.3 years, mostly men, with different levels of schooling, in the preoperative period of MRS.

Figure 2 presents the learning needs of patients before MRS identified, categorized into cardiovascular system and coronary artery disease; care, procedures, and routines before surgery; procedure and care during surgery; procedures and routines after surgery.

Figure 2. Learning needs of adult patients in the preoperative period of myocardial revascularization. Natal, Rio Grande do Norte, Brazil, 2021

Learning needs of adult patients in the preoperative period of myocardial revascularization		
Categories	**Cardiovascular system and coronary artery disease**	• Anatomy and physiology of the heart (4, 10, 13, 23) • Coronary artery disease: Risk factors, causes, signs and symptoms, measures to minimize disease progression and treatment (3, 4, 6, 12-14, 16, 19-23, 31, 38)
	Care, procedures, and routines before surgery	• Need and process of hospitalization — perioperative environment: Hospital characteristics, routines, team involved in care and surgical team, operating room (11, 12, 14, 16, 17, 19, 24, 33) • Care before surgery in the hospital: Preoperative exams, preoperative fasting, shaving, medication to reduce anxiety and facilitate sleep the day before and one hour before surgery (4, 13, 14, 19, 22, 23, 28, 30, 38) • Preoperative drugs (14, 17, 21, 24, 33, 37) • Psychological counseling regarding anxiety, fear, waiting for surgery, anger, stress (12, 13, 21, 23, 24, 26, 28, 36) • Infection control (4)
	Procedure and care during surgery	• Surgery names, how it is performed, goals, duration, cardiopulmonary bypass, complications, results, risks, prognosis, and survival rate (4, 6, 9, 11, 13, 14, 16, 17, 22-26, 30, 33, 36, 38, 39) • Anesthesia and post-anesthetic recovery (22, 30, 38)
	Care, procedures, and routines after surgery	• Postoperative environment of the Intensive Care Unit - bedside, equipment, routine activities and length of stay in the ICU. Family support: Visiting guidelines, hand hygiene (4, 5, 11, 13, 14, 17, 23-25, 30, 33) • Invasive devices and other postoperative care: Urine catheters, drains, monitoring lines, venous lines, orotracheal tube (intubation time, extubation), enteral tube, pacemaker, and bedside evacuations (5, 13, 14, 17, 24, 25, 30, 33) • Postoperative pain management and control: Pain experience, relief methods, and analgesia (4, 5, 14, 17, 18, 23, 24, 26, 27, 30, 33, 35, 36) • Postoperative nausea control (35) • Postoperative delirium and sedation in the ICU (5, 25, 30) • Surgical wound care (3, 4, 35) • Postoperative communication: Between patients, family members, ICU staff, communication methods (5, 17, 30, 33) • Post-surgical recovery (9, 12, 16, 19, 23) • Postoperative physical and pulmonary rehabilitation: Weaning from ventilation, breathing exercises, deep breathing, coughing, spirometer use, dyspnea control, walking, deambulation, mobility, active and passive exercises, physical activity (3, 4, 9, 11, 13, 14, 17, 21, 23, 24, 26, 27, 30, 33, 35, 37, 38) • Postoperative nutrition and weight control (3, 4, 14, 21, 23, 24, 27, 37) • Correct use of prescribed drugs (3, 4, 6)

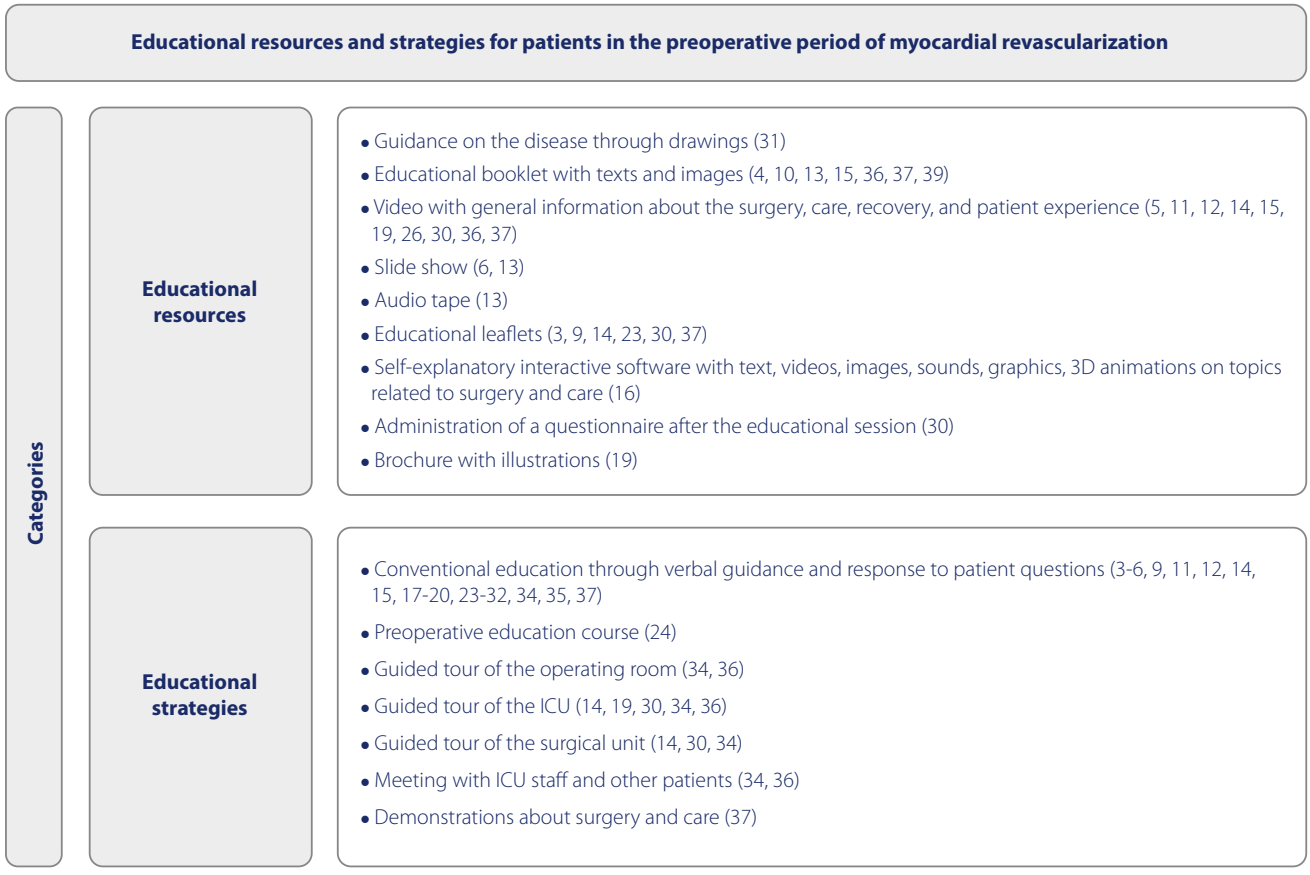
Source: Own elaboration.

Regarding the educational strategies used, it was noticed that the majority, 21 (60 %), were performed in the patient's own ward; two studies (5.71 %) also reported having used an exclusive room for patient education; one (2.86 %) performed in wards and outpatient spaces; one (2.86 %) in wards and cardiac rehabilitation room; one (2.86 %) in the counselling room; one (2.86 %) in coronary units, and six (17.14 %) did not report the place of implementation of educational actions.

As for those responsible for implementing the strategies, the participation of nurses was identified in 27 records (77.14 %); in 12 (34.29 %) the physician and seven (20 %) mentioned the health team, but did not specify which professionals. In addition, five (14.29 %) reported the involvement of psychologists; five (14.29 %) of physical therapists; three (8.57 %) did not report; two (5.71 %) of patients — peer education; two (5.71 %) of the nutritionist; one (2.86 %) of a occupational therapist; one (2.86 %) of the pharmacist; one (2.86 %) of the anesthesia technician, and one (2.86 %) of the social worker.

Educational interventions were implemented in certain situations early in hospitalization and/or with frequencies from one to 14 days before surgery. The duration of the activity ranged from five minutes to four hours. Figure 3 presents the resources and educational strategies used divided into two categories: resources and strategies.

Figure 3. Educational resources and strategies for patients in the preoperative period of MRS. Natal, Rio Grande do Norte, Brazil, 2021



Source: Own elaboration.

Discussion

Most of the records that are part of the sample of this study are articles made available in English. The countries that produced the most were the United States and Germany. This corroborates the idea of the important number of studies in these countries, which make them references to world science. It is also emphasized the need for the conduct of studies on the subject in all continents since CVD affects many individuals worldwide, which requires, in several situations, surgical treatment (40-45).

Regarding methodological quality, randomized clinical trials with a quantitative approach were highlighted. This type of study represents a high level of evidence, which can be used for decision-making and the foundation of clinical practice in cardiology by professionals who provide direct care to patients (46-48).

The study sample showed a variation of age groups, with an average age greater than 54 years. This is in agreement with the fact that aging is one of the main risk factors for CAD, which usually occurs in men over 55 years of age and women over 45 (34, 49-51).

It was also identified in the records the predominance of men with CVD, which agrees with the epidemiology of cardiovascular diseases. The male gender is placed as a risk factor for CVD, and a higher incidence and prevalence is perceived in this group, with an important mortality (52-54).

Regarding the learning needs of patients in the preoperative period of MRS, the first category represents the cardiovascular system and CAD with topics related to the physiology of the heart and the disease itself. Thus, it agrees with the importance of the guidance provided by the multidisciplinary team to the patient on this theme since they can contribute to a better treatment + during the hospitalization period, as evidenced in international studies (4, 31, 55-57).

The second category highlighted some care, procedures, and routines before surgery. In this category, reference is made to the knowledge about the hospitalization process, including the characteristics, routines, and the team involved in care. It is relevant to provide detailed information since, in several situations, it is a new context for the individual who will undergo surgery (5, 58, 59).

Moreover, the preparation of the patient can prolong the hospitalization time because it involves care such as the performance of several tests to better understand the profile of patients, the guarantee of the correct surgical indication, and the aid in the establishment of individual risk scores. They are important and contribute to better knowledge of each patient's case (60-62).

Fasting and trichotomy are also necessary for the procedure. This concerns the removal of hair in the chest, close to the radial arteries and the saphenous vein to prepare the skin of the area in which incisions will be made, according to the routines established by each service. Currently, it has been recommended to perform it no more than two hours before surgery, with a specific electrical device, because it helps in infection control, a theme that was also identified in this category (63, 64).

In addition, the studies cited the importance of an approach to the medications used by the patient and the administration of drugs to reduce anxiety and facilitate sleep on the eve and one hour before surgery. The drug strategy associated with psychological counseling and nursing interventions contribute to reduce the anxiety, fear, anger, and stress that can affect individuals (65, 66). This was highlighted in research conducted in China (Hong Kong) and Germany as important to minimize the psychological mechanisms mentioned above, which can be caused by uncertainties about survival, the risk of complications, the process of illness, and the insertion of the individual in the hospital environment (5, 36).

The third category comprises the procedure and care during surgery. It was related to the instruction about the proper name of the surgery, which can be RVM or saphenous or breast bridge; in addition, how it is performed and some characteristics, such as extracorporeal circulation, complications, results, risks, prognosis, and survival rate (67, 68). It is noteworthy that the previous items should be part of the scope of preoperative orientations since the patient needs to be aware of the interventions that will be performed during the surgery (36).

Additionally, in the same category, the importance of information on anesthesia and post-anesthetic recovery was highlighted. In this case, the patient needs to understand that MRS requires general anesthesia, induced exclusively with intravenous drugs or a combination of inhalation agents, known as volatile agents, used during the procedure (69-71).

Care, procedures, and routines after surgery represented the fourth category. It includes topics related to routines and important care that need to be adopted by patients and that directly influence postoperative recovery, as well as maintaining good health and quality of life. Topics such as the postoperative environment of the ICU and the invasive devices used also need to be addressed since, in the vast majority of situations, they are not known and will be part of the patient's context, especially in the first hours after leaving the operating room (33, 72, 73).

With regard to the experience of pain, it is known to be present since incisions are made in the thorax (sternotomy), the saphenous vein region (saphenectomy), and the places where the monitoring lines and invasive devices are inserted, such as the endotracheal

tube and the thoracic tube (5, 33, 74). In this case, the individual needs to be guided on measures to relieve pain, which can be through intravenous or oral medications, usually opioids and anti-inflammatory drugs (75, 76).

Additionally, events such as nausea and delirium can also happen. The first, ratified in a study conducted in Denmark with 310 patients, highlighted the importance of administering drugs for control (35). Delirium, which can occur postoperatively in the ICU, related to cognitive decline, was investigated in a recent meta-analysis that revealed prevalence in 43 % of patients up to four days, which remains high (39 %) up to one month after MRS (77).

Topics such as wound care, communication, recovery, physical and pulmonary rehabilitation, nutrition and weight control, and correct use of prescribed medications were also highlighted and should be part of the scope of guidance provided to patients. The preceding aims to improve the proposed treatment and the results with surgical intervention (3, 4, 33, 35).

Educational resources and strategies used by several professionals in the hospital environment were also identified, especially in the wards, to provide information to patients about their status, preoperative care, surgical intervention, and postoperative context. Nurses, physicians, psychologists, and physiotherapists were responsible for the implementation of these actions (5, 35, 36).

It is considered that, in the educational process implemented, several resources can be used to favor the learning of patients (5). The use of drawings, educational booklets with texts and images, videos, slides, audio tapes, interactive software, questionnaires, and other types of illustrations stood out as educational resources for training patients.

It is known that, with the evolution of knowledge and the development of learning resources, new technologies were incorporated into this process. They help provide valid and accurate information that impacts patient education. From this, the patient will understand how actions influence their treatment and may be actively involved in their care (78).

Regarding educational strategies, they were implemented through verbal education, short courses, guided tours, meeting with teams and other patients, and demonstrations about surgery and care.

All the resources and educational strategies identified in this review have their importance depending on the context in which they are employed and how they are used. These findings corroborate a randomized clinical trial conducted in Iran, which did not show significant differences in preoperative education through the implementation of verbal orientations or other re-

sources, but reinforced that preoperative training has benefits for the patient, such as reduced anxiety (79).

Limitations in the preparation of this review were the small number of data bases due to the recent restrictions in the portal made available for consultation by Brazilian researchers; the inclusion of many studies with more than ten years of publication; the restricted number of languages in the records; the absence of critical analysis of the methodological quality of the studies. However, because it is a scope review, some of these limitations may be considered because it is not necessary to include extensive literature on the subject. The critical-methodological analysis of the studies is also dispensed with.

Conclusions

The study identified that patients have several learning needs that should be considered by health professionals in planning and implementing the guidelines and care before myocardial revascularization surgery. They are related to the cardiovascular system and coronary artery disease itself; care, procedures, and routines before, during, and after surgery.

Therefore, the interprofessional team should implement, through various strategies, according to the available resources, educational activities that favor patient-centered teaching about their disease and the therapeutic plan to be implemented. Among the strategies, conventional education can be considered through verbal orientations, courses, guided tours, meetings with staff and patients, and demonstrations about surgery and care.

From this, it is possible to achieve a better patient's support to the conducts and guide the actions so that satisfactory clinical results are accomplished in the various stages of MRS surgery.

Based on the findings of this review, it is expected that professionals act in a way that is directed to implement educational activities based on the needs identified. In addition, we suggest conducting further studies to identify learning needs and educational strategies of patients who will undergo other types of surgeries, including different cardiac surgeries.

Conflict of interests: None declared.

References

1. World Health Organization (WHO). Cardiovascular Diseases (CVDs); 2017. Available from: https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)
2. Centers for Disease Control and Prevention (CDC). Coronary Artery Disease (CAD); 2019. Available from: https://www.cdc.gov/heartdisease/coronary_ad.htm
3. Golaghaie F, Esmaeili-Kalantari S, Sarzaeem M, Rafiei F. Adherence to lifestyle changes after coronary artery bypass graft: Outcome of preoperative peer education. Patient educ couns. 2019;102(12):2231-7. DOI: https://doi.org/10.1016/j.pec.2019.07.019
4. Chandrababu R, Nayak BS, Pai VB, N R, George LS, Devi ES, George A. Effects of foot massage and patient education in patients undergoing coronary artery bypass graft surgery: A randomized controlled trial. Complement Ther Clin Pract. 2020;40:101215. DOI: https://doi.org/10.1016/j.ctcp.2020.101215
5. Lai V, Ho KM, Wong WT, Leung P, Gomersall CD, Underwood MJ *et al.* Effect of preoperative education and ICU tour on patient and family satisfaction and anxiety in the intensive care unit after elective cardiac surgery: A randomised controlled trial. BMJ qual saf. 2021;30(3):228-35. DOI: https://doi.org/10.1136/bmjqs-2019-010667
6. Rushton M, Howarth M, Grant MJ, Astin F. Person-centred discharge education following coronary artery bypass graft: A critical review. J. clin nurs. 2017;26(23-24):5206-15. Available from: https://doi.org/10.1111/jocn.14071
7. Joanna Briggs Institute (JBI). Manual for evidence synthesis. The Joanna Briggs Institute; 2020. Available from: https://wiki.jbi.global/display/MANUAL/Downloadable+PDF+-+current+version
8. The Joanna Briggs Institute (JBI). The JBI Approach. Grades of recommendation. Levels of Evidence. The Joanna Briggs Institute; 2014. Available from: https://jbi.global/sites/default/files/2019-05/JBI-Levels-of-evidence_2014_0.pdf
9. Mahler HI, Kulik JA. Preferences for health care involvement, perceived control and surgical recovery: a prospective study. Soc Sci Med. 1990;31(7):743-51. DOI: https://doi.org/10.1016/0277-9536(90)90169-S
10. Lepczyk M, Raleigh EH, Rowley C. Timing of preoperative patient teaching. J Adv Nurs. 1990; 15(3):300-6. DOI: https://doi.org/10.1016/0277-9536(90)90169-S
11. Mahler HI, Kulik JA. Effects of preparatory videotapes on self-efficacy beliefs and recovery from coronary bypass surgery. Ann Behav Med. 1998;20(1):39-46. DOI: https://doi.org/10.1007/BF02893808
12. Arthur HM, Daniels C, McKelvie R, Hirsh J, Rush B. Effect of a preoperative intervention on preoperative and postoperative outcomes in low-risk patients awaiting elective coronary artery bypass graft surgery. A randomized, controlled trial. Ann Intern Med. 2000;133(4):253-62. DOI: https://doi.org/10.7326/0003-4819-133-4-200008150-00007
13. Shuldham CM. Pre-operative education for the patient having coronary artery bypass surgery. Patient Educ Couns. 2001;43(2):129-37. DOI: https://doi.org/10.1016/S0738-3991(00)00160-9
14. Shuldham CM, Fleming S, Goodman H. The impact of pre-operative education on recovery following coronary artery bypass surgery. A randomized controlled clinical trial. Eur Heart J. 2002;23(8):666-74. DOI: https://doi.org/10.1053/euhj.2001.2897
15. Watt-Watson J, Stevens B, Katz J, Costello J, Reid GJ, David T. Impact of preoperative education on pain outcomes after coronary artery bypass graft surgery. Pain. 2004;109(1-2):73-85. DOI: https://doi.org/10.1016/j.pain.2004.01.012
16. Kayhan N, Reinerth G, Albers J, Hagl S, Vahl C. Präoperative Aufklärung über neue Operationsstrategien: Interaktive Software zur Verbesserung der Patienteninformation. Z Herz- Thorax- Gefasschir. 2005;19(1):13-24. DOI: https://doi.org/10.1007/s00398-005-0463-7
17. Martin CG, Turkelson SL. Nursing care of the patient undergoing coronary artery bypass grafting. J Cardiovasc Nurs. 2006;21(2):109-17. DOI: https://doi.org/10.1097/00005082-200603000-00006
18. Parthum A, Weinzierl A, Grässel E, Koppert W. Preoperative pain training. No influence on postoperative pain perception in patients undergoing cardiac surgery. Schmerz. 2006;20(4):315-26. DOI: https://doi.org/10.1007/s00482-005-0441-8
19. Sørlie T, Busund R, Sexton J, Sexton H, Sørlie D. Video information combined with individualized information sessions: Effects upon emotional well-being following coronary artery bypass surgery-A randomized trial. Patient Educ Couns. 2007;65(2):180-8. DOI: https://doi.org/10.1016/j.pec.2006.07.006
20. Krannich JH, Weyers P, Lueger S, Faller H, Schimmer C, Deeg P, et al. The short- and long-term motivational effects of a patient education programme for patients with coronary artery bypass grafting. Rehabilitation. 2008;47(4):219-25. DOI: https://doi.org/10.1055/s-2007-1004598
21. Krannich JH, Herzog M, Weyers P, Lueger S, Faller H, Bohrer T *et al.* Patients' needs during hospitalization in a cardiac surgery unit before and after coronary artery bypass graft surgery. Thorac Cardiovasc Surg. 2009;57(1):22-4. DOI: https://doi.org/10.1055/s-2008-1038725
22. Galdeano LE, Rossi LA, Spadoti Dantas RA. Deficient knowledge nursing diagnosis: Identifying the learning needs of patients with cardiac disease. Int J Nurs Terminol Classif. 2010;21(3):100-7. DOI: https://doi.org/10.1111/j.1744-618X.2010.01155.x
23. Ozer N, Akyil R, Yurttas A. The effect of education on the stress levels in patients undergoingcoronary artery bypass graft surgery. Pak J Med Sci. 2010;26(2):282-7. Available from: https://www.researchgate.net/publication/228657287_The_effect_of_education_on_the_stress_levels_in_patients_undergoing_coronary_artery_bypass_graft_surgery
24. Zhang CY, Jiang Y, Yin QY, Chen FJ, Ma LL, Wang LX. Impact of nurse-initiated preoperative education on postoperative anxiety symptoms and complications after coronary artery bypass grafting. J Cardiovasc Nurs. 2012;27(1):84-8. DOI: https://doi.org/10.1097/JCN.0b013e3182189c4d
25. Lee J, Jung J, Noh JS, Yoo S, Hong YS. Perioperative psycho-educational intervention can reduce postoperative delirium in patients after cardiac surgery: A pilot study. Int J Psychiatry Med. 2013;45(2):143-58. DOI: https://doi.org/10.2190/PM.45.2.d
26. Veronovici NR, Lasiuk GC, Rempel GR, Norris CM. Discharge education to promote self-management following cardiovascular surgery: an integrative review. Eur J Cardiovasc Nurs. 2014;13(1):22-31. DOI: https://doi.org/10.1177/1474515113504863
27. Varaei S, Shamsizadeh M, Cheraghi MA, Talebi M, Dehghani A, Abbasi A. Effects of a peer education on cardiac self-efficacy and readmissions in patients undergoing coronary artery bypass graft surgery: a randomized-controlled trial. Nurs Crit Care. 2017;22(1):19-28. DOI: https://doi.org/10.1111/nicc.12118
28. Uyar IS, Akpınar MB, Şahin V, Abacıla AF, Uç H, Varol R *et al.* Preoperative education may attenuate anger scores of patients after cardiac surgery. Turk Gogus Kalp Dama. 2014;22(3):547-52. DOI: https://doi.org/10.5606/tgkdc.dergisi.2014.9411
29. Højskov IE, Moons P, Hansen NV, Greve H, Olsen DB, Cour SL *et al.* Early physical training and psycho-educational interven-

tion for patients undergoing coronary artery bypass grafting. The SheppHeart randomized 2 × 2 factorial clinical pilot trial. Eur J Cardiovasc Nurs. 2016;15(6):425-37. DOI: https://doi.org/10.1177/1474515115594524

30. Lai VK, Lee A, Leung P, Chiu CH, Ho KM, Gomersall CD *et al*. Patient and family satisfaction levels in the intensive care unit after elective cardiac surgery: Study protocol for a randomised controlled trial of a preoperative patient education intervention. BMJ Open. 2016;6(6):e011341. DOI: https://doi.org/10.1136/bmjopen-2016-011341

31. Nowicka-Sauer K, Jarmoszewicz K, Trzeciak B, Roszak K, Zemla A, Beta S *et al*. Constructivism in patient education: using drawings to explore preconception of coronary artery disease. Kardiol Pol. 2018;76(8):1274-6. DOI: https://doi.org/10.5603/KP.2018.0165

32. Mousavi Malek N, Zakerimoghadam M, Esmaeili M, Kazemnejad A. Effects of nurse-led intervention on patients' anxiety and sleep before coronary artery bypass grafting. Crit Care Nurs Q. 2018;41(2):161-9. DOI: https://doi.org/10.1097/CNQ.0000000000000195

33. Macleod, CE. Emergency coronary artery bypass grafting: An overview. Nurs crit Care. 2019; 14(3):8-13. DOI: https://doi.org/10.1097/01.CCN.0000554831.89961.bc

34. Niknejad R, Mirmohammad-Sadeghi M, Akbari M, Ghadami A. Effects of an orientation tour on preoperative anxiety in candidates for coronary artery bypass grafting: A randomized clinical trial. ARYA Atheroscler. 2019;15(4):154-60. DOI: https://doi.org/10.22122/arya.v15i4.1806

35. Højskov IE, Moons P, Egerod I, Olsen PS, Thygesen LC, Hansen NV *et al*. Early physical and psycho-educational rehabilitation in patients with coronary artery bypass grafting: A randomized controlled trial. J Rehabil Med. 2019;51(2):136-43. DOI: https://doi.org/10.2340/16501977-2499

36. Salzmann S, Salzmann-Djufri M, Wilhelm M, Euteneuer F. Psychological Preparation for Cardiac Surgery. Curr Cardiol Rep. 2020;22(12):172. DOI: https://doi.org/10.1007/s11886-020-01424-9

37. Rizkallah SG. The health education needs of the patient and family upon discharge after a myocardial infarction [dissertação]. Durban: University of Natal; 2002. Available from: https://researchspace.ukzn.ac.za/handle/10413/4806?show=full

38. Galdeano LE. Validação do diagnóstico de enfermagem conhecimento deficiente em relação à doença arterial coronariana e à revascularização do miocárdio [tese]. São Paulo: Universidade de São Paulo; 2007. Disponível em: https://www.teses.usp.br/teses/disponiveis/83/83131/tde-19032008-163504/pt-br.php

39. Mclaughlin PA. Development and usability evaluation of preoperative teaching materials for CABG/Valve Surgery Patients [projeto acadêmico]. Baltimore: University of Maryland; 2017. Available from: https://archive.hshsl.umaryland.edu/bitstream/handle/10713/6526/McLaughlin_TeachingMatsForCABGPatients_2017.pdf?sequence=1

40. Şahin B, İlgün G. Risk factors of deaths related to cardiovascular diseases in World Health Organization (WHO) member countries. Health Soc Care Community. 2020;00:1-8. DOI: https://doi.org/10.1111/hsc.13156

41. Zhao D, Liu J, Wang M, Zhang X, Zhou M. Epidemiology of cardiovascular disease in China: Current features and implications. Nat Rev Cardiol. 2019;16:203-12. DOI: https://doi.org/10.1038/s41569-018-0119-4

42. Turk-Adawi K, Sarrafzadegan N, Fadhil I, Taubert K, Sadeghi M, Wenger NK *et al*. TURK-ADAWI, Karam et al. Cardiovascular disease in the Eastern Mediterranean region: epidemiology and risk factor burden. Nat Rev Cardiol. 2018;15:106-19. DOI: https://doi.org/10.1038/nrcardio.2017.138

43. Volgman AS, Palaniappan LS, Aggarwal NT, Gupta M, Khandelwal A, Krishnan AV *et al*. (2018). Atherosclerotic cardiovascular disease in South Asians in the United States: epidemiology, risk factors, and treatments: A scientific statement from the American Heart Association. Circulation. 2018;138(1):e1-34. DOI: https://doi.org/10.1161/CIR.0000000000000580

44. Yun JS, Ko SH. Current trends in epidemiology of cardiovascular disease and cardiovascular risk management in type 2 diabetes. Metab. 2021;123:1548382. DOI: https://doi.org/10.1016/j.metabol.2021.154838

45. Yuyun MF, Sliwa K, Kengne AP, Mocumbi AO, Bukhman G. Cardiovascular diseases in Sub-Saharan Africa compared to high-income countries: An epidemiological perspective. Glob Heart. 2020;15(1):1-18. DOI: https://doi.org/10.5334/gh.403

46. Faria L, Oliveira-Lima JA, Almeida-Filho N. Medicina baseada em evidências: breve aporte histórico sobre marcos conceituais e objetivos práticos do cuidado. Hist Ciênc saúde-Manguinhos. 2021;28(1):59-78. DOI: https://doi.org/10.1590/s0104-59702021000100004

47. Ribeiro AL, Oliveira GMM. Toward a Patient-Centered, Data-Driven Cardiology. Arq Bras Cardiol. 2019;112(4):371-3. DOI: https://doi.org/10.5935/abc.20190069

48. Li M, Zhang J, Gan TJ, Qin G, Wang L, Zhu M *et al*. Enhanced recovery after surgery pathway for patients undergoing cardiac surgery: a randomized clinical trial. Eur j cardiothorac surg. 2018;54(3):491-7. DOI: https://doi.org/10.1093/ejcts/ezy100

49. Noale M, Limongi F, Maggi S. Epidemiology of cardiovascular diseases in the elderly. Adv exp med biol. 2020;1216:29-38. DOI: https://doi.org/10.1007/978-3-030-33330-0_4

50. Ren J, Zhang Y. Targeting autophagy in aging and aging-related cardiovascular diseases. Trends pharmacol. sci. 2018;39(12):1064-76. DOI: https://doi.org/10.1016/j.tips.2018.10.005

51. Serino A, Salazar G. Protective role of polyphenols against vascular inflammation, aging and cardiovascular disease. Nutrients. 2019;11(1):1-23. DOI: https://doi.org/10.3390/nu11010053

52. Mussi FC, Teixeira JB. Fatores de risco cardiovascular, doenças isquêmicas do coração e masculinidade. Rev Cubana Enferm. 2018;34(2):1-13. Disponível em: http://www.revenfermeria.sld.cu/index.php/enf/article/view/1613

53. Vainshelboim B, Chan K, Chen Z, Myers J. Cardiorespiratory fitness and cancer in men with cardiovascular disease: Analysis from the Veterans Exercise Testing Study. Eur j prev cardiol. 2021;28(7):715-21. DOI: https://doi.org/10.1177/2047487320916595

54. Amiri P, Mohammadzadeh-Naziri K, Abbasi B, Cheraghi L, Jalali-Farahani S, Momenan AA *et al*. Smoking habits and incidence of cardiovascular diseases in men and women: Findings of a 12year follow up among an urban Eastern-Mediterranean population. BMC public health. 2019;19(1):1-10. DOI: https://doi.org/10.1186/s12889-019-7390-0

55. Banharak S, Zahrli T, Matsuo H. Public Knowledge about Risk Factors, Symptoms, and First Decision-making in Response to Symptoms of Heart Attack among Lay People. Pacific Rim International Journal of Nursing Research. 2018;22(1):18-28. Avaliable from: https://he02.tci-thaijo.org/index.php/PRIJNR/article/view/93505

56. Salzwedel A, Heidler MD, Meng K, Schikora M, Wegscheider K, Reibis R et al. Impact of cognitive performance on disease-related knowledge six months after multi-component rehabilitation in patients after an acute cardiac event. Eur j prev cardiol. 2019;26(1):46-55. DOI: https://doi.org/10.1177/2047487318791609

57. Fredericks S, Yau T. Clinical effectiveness of individual patient education in heart surgery patients: A systematic review and meta-analysis. Int j nurs stud. 2017;65:44-53. DOI: https://doi.org/10.1016/j.ijnurstu.2016.11.001

58. Kathania D, Singh NV, Kaur S, Kumar R. Patients perception about Coronary Artery Bypass Graft (CABG) surgery during waiting period: A phenomenological study. Nursing and Midwifery Research Journal. 2021;17(1):31-7. DOI: https://doi.org/10.33698/NRF0330

59. Pereira DA, Ferreira TM, Silva JI, Gomes ET, Bezerra SMMS. Learning needs about cardiac surgery from the perspective of patients and nurses. Rev SOBECC. 2018;23(2):84-8. DOI: https://doi.org/10.5327/Z1414-4425201800020005

60. Martins LM, Kazitani BS, Bolela F, Maier SRO, Dessotte CAM. Sintomas de ansiedade, depressão e ansiedade cardíaca pré-operatórios segundo o tipo de cirurgia cardíaca. REME rev min enferm. 2020;25:1-8. DOI: https://doi.org/10.5935/1415-2762-20210002

61. Knihs NS, Valmorbida AP, Lanzoni GMM, Roza BA, Ghellere A. Path taken to heart surgery: needs and expectations in preoperative preparation. Av enferm. 2017;35(1):30-41. DOI: https://doi.org/10.15446/av.enferm.v35n1.60753

62. Meadows K, Gibbens R, Gerrard C, Vuylsteke A. Prediction of patient length of stay on the intensive care unit following cardiac surgery: A logistic regression analysis based on the cardiac operative mortality risk calculator, EuroSCORE. J cardiothoracic vasc anest. 2018;32(6):2676-82. DOI: https://doi.org/10.1053/j.jvca.2018.03.007

63. Oliveira MC, Andrade AYT, Turrini RNT, Poveda VB. Negative pressure wound therapy in the treatment of surgical site infection in cardiac surgery. Rev Bras Enferm. 2020;73(5):e20190331. DOI: https://doi.org/10.1590/0034-7167-2019-0331

64. Andrade LS, Siliprandi EMO, Karsburg LL, Berlesi FP, Carvalho OLF, Rosa DS *et al*. Surgical Site Infection Prevention Bundle in Cardiac Surgery. Arq Bras Cardiol. 2019;112(6):769-74. DOI: https://doi.org/10.5935/abc.20190070

65. Akhlaghi E, Babaei S, Mardani A, Eskandari F. The effect of the neuman systems model on anxiety in patients undergoing coronary artery bypass graft: A randomized controlled trial. The Journal of Nursing Research: JNR. 2021;29(4):pe162. DOI: https://doi.org/10.1097/JNR.0000000000000436

66. Velikanov AA, Stoljarova AA, Protasov EA, Zelenskaya IA, Lubinskaya EI. Dynamics of psychoemotional characteristics in patients with coronary heart disease after coronary artery bypass graft surgery: Russian sampling specifics. RUDN Journal of Psychology and Pedagogics. 2020;17(2):310-29. DOI: https://doi.org/10.22363/2313-1683-2020-17-2-310-329

67. Kamenshchikov NO, Mandel IA, Podoksenov YK, Svirko JS, Lomivorotov V, Mikheev SL et al. Nitric oxide provides myocardial protection when added to the cardiopulmonary bypass circuit during cardiac surgery: Randomized trial. The J of Thor and Card Surgery. 2019;157(6):2328-36. DOI: https://doi.org/10.1016/j.jtcvs.2018.08.117

68. Hussain SMA, Harky A. Complications of coronary artery bypass grafting. Int J Med Ver. 2019;6(1):1-5. DOI: https://doi.org/10.29252/IJMR-060101

69. Landoni G, Lomivorotov VV, Nigro Neto C, Monaco F, Pasyuga VV, Bradic N *et al*. Volatile anesthetics versus total intravenous anesthesia for cardiac surgery. N Engl J Med. 2019;380(13):1214-25. DOI: https://doi.org/10.1056/NEJMoa1816476

70. Jiao XF, Lin XM, Ni XF, Li HL, Zhang C, Yang CS *et al*. Volatile anesthetics versus total intravenous anesthesia in patients undergoing coronary artery bypass grafting: An updated meta-analysis and trial sequential analysis of randomized controlled trials. PLos ONE. 2019;14(10):e0224562. DOI: https://doi.org/10.1371/journal.pone.0224562

71. Oh TK, Song IA. Total Intravenous Anesthesia was associated with better survival outcomes after coronary artery bypass grafting: A retrospective cohort study with 3-year follow-up in South Korea. J cardiothoracic vasc anest. 2020;34(12):3250-56. DOI: https://doi.org/10.1053/j.jvca.2020.07.025

72. Pagnucci N, Tolotti A, Cadorin L, Valcarenghi D, Forfori F. Promoting nighttime sleep in the intensive care unit: Alternative strategies in nursing. Intensive crit care nurs. 2019;51(1):73-81. DOI: https://doi.org/10.1016/j.iccn.2018.11.010

73. Santos NC, Lima CJFS, Rosa Junior SLR, Silva GF. Nursing care in the post-operatory of cardiac surgery. Res, Soc and Devel. 2020;9(11):e629119535. DOI: https://doi.org/10.33448/rsd-v9i11.9535

74. Gimpe D, Fisher R, Khan Z, McCormack DJ. Primary care management of chest pain after coronary artery bypass surgery. BMJ. 2019;365:l1303. DOI: https://doi.org/10.1136/bmj.l1303

75. Javaherforooshzadeh F, Abdalbeygi H, Janatmakan F, Gholizadeh B. Comparing the effects of ketorolac and Paracetamol on postoperative pain relief after coronary artery bypass graft surgery. A randomized clinical trial. J Cardiothorac Surg. 2020;15(1):80. DOI: https://doi.org/10.1186/s13019-020-01125-y

76. Tüfekçi H, Akansel N, Sivrikaya SK. Pain Interference with Daily Living Activities and Dependency Level of Patients Undergoing CABG Surgery. Pain manag nurs. 2021;3(20):1-8. DOI: https://doi.org/10.1016/j.pmn.2021.03.002

77. Greaves D, Psaltis PJ, Ross TJ, Davis D, Smith AE, Boord MS *et al*. Cognitive outcomes following coronary artery bypass grafting: a systematic review and meta-analysis of 91.829 patients. Int J Cardiol. 2019;289:43-9. DOI: https://doi.org/10.1016/j.ijcard.2019.04.065

78. Lima AMC, Piagge CSLD, Silva ALO, Robazzi MLCC, Mélo CB, Vasconcelos SC. Tecnologias educacionais na promoção da saúde do idoso. Enferm Foco. 2020;11(4):87-96. DOI: https://doi.org/10.21675/2357-707X.2020.v11.n4.3277

79. Amini K, Alihossaini Z, Ghahremani Z. Randomized Clinical Trial Comparison of the Effect of Verbal Education and Education Booklet on Preoperative Anxiety. J Perianesth Nurs. 2019;34(2):289-96. DOI: https://doi.org/10.1016/j.jopan.2018.06.101