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EMPIRICAL INDICATORS OF CARDIOVASCULAR REHABILITATION BEHIND ROY ADAPTIVE MODEL

Indicadores empíricos da reabilitação cardiovascular sob a otica do modelo adaptativo de roy

Indicadores empiricos de rehabilitación cardiovascular detrás del modelo adaptable roy

Maria Sinara Farias[1]; Lúcia de Fátima da Silva[2]*

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ABSTRACT

Objective: To identify, from the scientific literature, the empirical indicators of cardiovascular rehabilitation (CVR) organized according to the adaptive modes of Roy's Adaptation Model. **Method:** this is an integrative review study conducted in the Scientific Electronic Library Online (SCIELO), Latin American and Caribbean Health Sciences Literature (LILACS), Nursing Database (BDENF), PUBMED. and Online Medical Literature Search and Analysis System (MEDLINE), using the descriptors "Cardiovascular Rehabilitation"; Nursing. We included 42 studies, all read in full and synthesized according to Roy's adaptive modes. **Results:** the analyzed studies present empirical indicators of CRV that are configured in the physiological mode, self-concept, role performance and interdependence. **Conclusion:** it enabled a rescue of theoretical knowledge regarding the process of CVR, which leads to the need to know the empirical indicators of this concept to enable to recognize when the CVR is fully, partially or not achieved.

Descriptors: Reabilitação cardiovascular, Teorias de enfermagem, Enfermagem, Indicadores, Empirismo, Revisão.

[1] Undergraduate Nursing Course at Centro Universitário INTA. Master in Clinical Care in Nursing and Health from the State University of Ceará (UECE). Doctoral student in Clinical Care in Nursing and Health at the State University of Ceará (UECE). Ceará State University (UECE)

[2] Undergraduate Nursing Course at Ceará State University. Master in Nursing from the Federal University of Ceará. PhD in Nursing from the Federal University of Ceará. Professor of the Nursing Undergraduate Course and the Graduate Program in Clinical Care in Nursing and Health at the State University of Ceará. State University of Ceará (UECE)

RESUMO

Objetivo: Analisar a(s) concepção(ões) de enfermeiras que atuam no cenário hospitalar sobre tecnologias do cuidar e educar. **Métodos:** pesquisa qualitativa, descritiva-exploratória, fundamentada pelo referencial filosófico da práxis humana. Desenvolvida com 21 enfermeiras de um Hospital público do Sul do Brasil. A coleta dos dados ocorreu por meio de entrevista semiestruturada e observação. Para análise, utilizou-se a técnica de análise de conteúdo temática. **Resultados:** emergiram duas categorias: tecnologias do cuidar: da utilização em si às maneiras de se utilizar e gerenciar; e tecnologias do educar: aproximações com a práxis do educar-cuidando e cuidar-educando. **Conclusão:** analisar e refletir sobre conceitos de tecnologias do cuidado e educação demonstrou que os enfermeiros necessitam evoluir seus conhecimentos sobre essas definições, no intuito de aplicá-las na/para tomada de decisões, elevando assim, a qualidade dos resultados assistenciais.

Descritores: Tecnologia, Enfermagem, Cuidados de enfermagem, Assistência hospitalar, Formação de conceito.

RESUMEN

Objetivo: Analizar la (s) concepción (es) de enfermeras que actúan en el escenario hospitalario sobre tecnologías del cuidar y educar. **Método:** investigación cualitativa, descriptiva-exploratoria, fundamentada por el referencial filosófico de la praxis humana. Desarrollada con 21 enfermeras de un Hospital público del sur de Brasil. La recolección de los datos ocurrió por medio de entrevista semiestructurada y observación. Para el análisis, se utilizó la técnica de análisis de contenido temático. **Resultado:** surgieron dos categorías: tecnologías del cuidado: de la utilización en sí a las maneras de utilizar y administrar; y tecnologías del educar: acercamientos con la praxis del educar-cuidando y cuidar-educando. **Conclusión:** analizar y reflexionar sobre conceptos de tecnologías del cuidado y educación demostró que los enfermeros necesitan evolucionar sus conocimientos sobre esas definiciones, con el fin de aplicarlas en la toma de decisiones, elevando así la calidad de los resultados asistenciales.

Descriptores: Tecnología, Enfermería, Atención de enfermeira, Atención hospitalaria, Formación de concepto.

INTRODUCTION

In the development of Nursing through the search for own knowledge, there was the advent of nursing theories, as the maximum of knowledge. Its focus includes support in other areas of knowledge and seeks to characterize or explain some phenomenon, referring to interrelated concepts, statements, propositions and definitions that can be deduced, tested and verified. [1-2]

Nursing theories are sources that support clinical care practices. They have evidence to validate certain activities and act to justify, affirm and promote comprehensive and humanized care.

Each nursing theory is developed with a particular purpose and relevance, so that they can be flexible to the different contexts of nursing practice.

In this context, in view of the existence of several nursing theories, there is the Roy Adaptation Model (MAR), which contributes to the nursing care implemented for patients who, due to some stimulus, need coping mechanisms for the nursing process. adaptation.

In the clinical practice of nurses, the possibility of implementing a nursing theory occurs through the Nursing Process (NP), which acts as an instrument that guides professional nursing care and the documentation of their professional practice, which enables organize and prioritize patient care and keep the focus on what's important. [3]

MAR has a guide for its implementation guided by the Nursing Process, which is simultaneous and continuous and constitutes an approach to solve problems. Thus, considering that each person deals differently with changes in their health status, it is emphasized that it is the nurse's responsibility to help people adapt to these changes.[4]

In view of the flexibility of the use of theories in different nursing contexts, their implementation in the face of people with Cardiovascular Disease (CVD), it is necessary, since the patient presents an illness of this nature, he needs specific care with the purpose to improve their clinical situation, so that they return to their activities as early as possible, also helping to reduce recurrences. In this regard, actions aimed at the patient's cardiovascular rehabilitation are considered as an important end of clinical nursing care.

Therefore, cardiovascular rehabilitation (CVR) is considered to be "a set of activities necessary to ensure that people with cardiovascular diseases have optimal physical, mental and social conditions, which will allow them to occupy as normal a place as possible in society".[5]

In this sense, a relevant practice in the care of people in CVR is the identification of empirical indicators (IE). The SIs represent the specific, observable and measurable concepts of a phenomenon.[6] It is justified to know the SIs so that the data collection is more focused, which facilitates and enables the planning of nursing care.

Given this, we sought to identify, in the scientific literature, the empirical indicators of cardiovascular rehabilitation, organized according to the adaptive modes of the Roy Adaptation Model.

METHODS

It is an integrative review study based on the following steps: formulation of the problem (elaboration of the guiding question, keywords and inclusion criteria); search procedures (inclusion of relevant literature on the topic of interest); data evaluation (extraction of relevant information from selected articles); data analysis and interpretation (data integration process); and presentation of the review. [7]

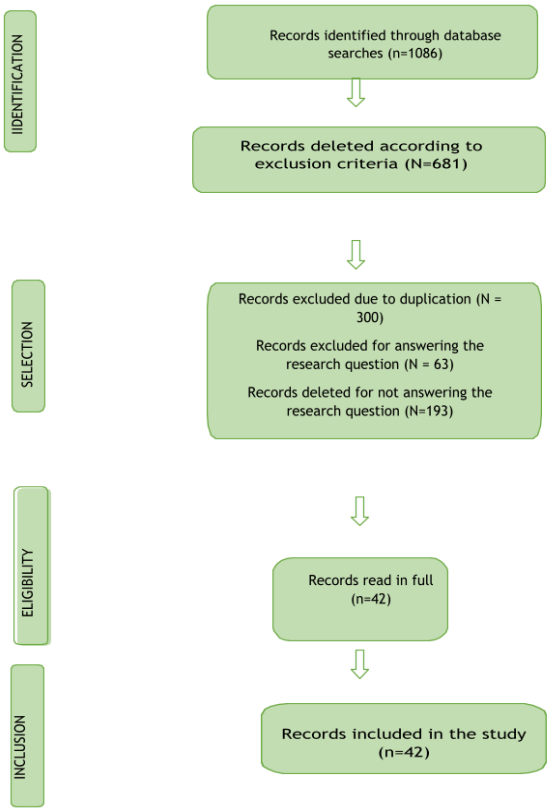
For this purpose, the problem question for the integrative review was: What empirical indicators make up the definition of the concept of cardiovascular rehabilitation?

A search of the literature was then carried out in the databases: Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature in Health Sciences (LILACS), Nursing Database (BDENF),

Publications Medical (PUBMED) and the Online Medical Literature Search and Analysis System (MEDLINE), using the descriptors registered in the DeCS (Health Science Descriptors) "Cardiovascular Rehabilitation"; "Nursing" connected by the Boolean operator and.

We included productions with languages in Portuguese, English and Spanish, published since 1966, a landmark description of the emergence of Supervised Cardiac Rehabilitation Programs 8, with complete and free texts available. Those who repeated themselves and did not correspond to the guiding question of the review were excluded. The search was carried out in June 2018. Figure 1 shows the search process for the selected articles in the databases.

Figure 1. Search process for selected articles in the databases. Fortaleza (CE), 2018.



When analyzing Figure 1, it can be seen that 42 studies were included, all were read in full and synthesized according to Roy's adaptive modes, the empirical indicators identified.

For data extraction, an adapted instrument developed by nursing researchers was used, which consists of items related to the identification of the article; methodological characteristics and assessment of methodological rigor. 9 The evaluation of the studies regarding the level of evidence (NE) followed the Oxford Center Evidence Based Medicine 10 and the empirical indicators identified were organized based on Roy's adaptive ways to better understand the subject.

RESULTS AND DISCUSSION

After reading the selected productions, the empirical indicators of Cardiovascular Rehabilitation were identified. In **Figure 2**, the characterization of the selected articles is presented, regarding the year of publication, authors, magazine, type of study and country.

Figure 2. Characterization of the selected articles, according to the year of publication, authors, magazine, type of study and country. Fortaleza (CE), 2018.

Nº	Autores/ Ano de publicação	Revistas/ Países	Tipos de estudo
A1	MUSSI, F.C. 2004	Rev Latino-am Enfermagem/ Brasil	Qualitative
A2	MORAES, T.P.R.; DANTAS, R.A.S. 2007	Rev Latino-am Enfermagem/ Brasil	Transversal
A3	TILLER, S.; LEGER-CALDWELL, L.; O'FARRELL,P.; PIPE, A. L.; MARK , A.E. /2007	J Cardiopulm Rehabil Prev/ Canadá	Quantitative
A4	FERNANDEZ, R.S.; DAVIDSON, R.; GRIFFITHS, R./ 2008	Journal of Cardiovascular Nursing/ Austrália	Qualitative
A5	LUNELLI, R.P.; RABELLO, E.R.; STEIN, R.; GOLDMEIER, S., MORAES, M.A./2008	Arq Bras Cardiol/ Brasil	Transversal
A6	CORTES, O.L.; VARELA, L.E./ 2009	Salud UIS/Colombia	Revisão Sistemática
A7	FERNANDEZ, R.S.; DAVIDSON, P.; GRIFFITHS, R.; SALAMONSON. Y./2009	European Journal of Cardiovascular Nursing. /Austrália	Qualitative
A8	WANGW.; CHAIR, S.Y.; THOMPSON, D.R.; TWINN, S.F./2009	Journal of Clinical Nursing /China	Qualitative
A9	BYRNE, G.; MURPHY, F./2010	Journal of Renal Care/Ireland	Bibliographic
A10	GIALLAURIA, F.; VIGORITO, C.; TRAMARIN, R.; FATTIROLLI, F.; AMBROSETTI, M.; FEO, S.; GRIFFO, R.; RICCIO, C./2010	J Gerontol A Biol Sci Med Sci /Italy	Observacional
A11	DAVIDSON, P.; COCKBURN, J.; NEWTON, P.J.; WEBSTER, J.K.; BETIHAVAS, V.; HOWES, L.; OWENSBYE, D.O./2010	European Journal of Cardiovascular Prevention & Rehabilitation/Australia	Randomized
A12	ARTHUR, H.M.; SUSKIN, N.; BAYLEY, M.; FORTIN, M.; HOWLETT, J.; HECKMAN, G.; LEWANCZUK,R./2010	Can J Cardiol /Canada	Qualitative
A13	ROLFE, E.D.; SUTTON, E.J.; LANDRY, M.; STERNBERG, L.; PRICE, J.A.D./2010	Journal of Cardiovascular Nursing /Canada	Qualitative
A14	NUNES, S.; REGO, G.; NUNES, R./2011	Revista de Enfermagem Referência /Portugal	Transversal
A15	YEE, J.; UNSWORTH, K.; SUSKIN, N.; REID, R.D.; JAMNIK, V.; GRACE, S./2011	BMC Health Services Research /Canada	Transversal
A16	CAMPONOGARA, S.; SILVEIRA, M.; LANA, L.D.; BOTTOLI, C.; ROSSATO, K.; BARROS, C./ 2012	Rev Enferm UFPI /Brazil	Qualitative
A17	DOLANSKY, M.A.; ZULLO, D.M.; HASSANEIN, S.; SCHAEFER, J.T.; MURRAY, P.; BOXER, R./2012	Heart Lung. /USA	Transversal
A18	URRUTIA. I.B.; SUAZO, S.V.; CARRILLO, K.S./ 2012	Ciencia y Enfermería /Chile	Quase-experimental
A19	WONG, W.P.; FENG, J.; PWEE, K.H.; LIM, J. /2012	BMC Health Services Research / Singapore	Revisão Sistemática
A20	WEST, R; JONES, D./2013	Heart /UK	Quantitative
A21	ASTIN, F.; CARROLL, D.L.; GEEST, S.D.; MARTENSSON, J./2014	Eur J Cardiovasc Nurs. / Europe	Transversal
A22	CAMPONOGARA, S.; LANA, L.D.; BOTTOLI, C.; CIELO, C.; RODRIGUES, I.L./2014	J. res.: fundam. care. /Brazil	Quantitative
A23	GRACE, S.L.; BENNETT, S.; ARDERN, C.I.; CLARK, A./2014	Prog Cardiovasc Dis./Canada	Quantitative
A24	MOSLEH, S.M.; BOND, C.M.; LEE, A.J.; KIGER, A.; CAMPBELL, N.C./2014	Eur J Cardiovasc Nurs /UK	Randomized
A25	HARBMAN, P./ 2014	Int J Nurs Stud./Canada.	Coorte
A26	LEAR, S.A.; SINGER, J.; BANNER-LUKARIS,, D.; HORVAT, D.; PARK, J.E.; BATES, J.; IGNASZEWSKI, A./2014	Circ Cardiovasc Qual Outcomes /Canada	Randomized
A27	CARTLEDGE, S.; FELDMAN, S.; BRAY, J.E.; STUB, D.; FINN, J./2015	Heart /Australia	Transversal
A28	CHEN, H.M.; LIU, C.K.; CHEN, H.W.; SHIA, B.C.; CHEN, M.; CHUNG, C.H./2015	Kaohsiung Journal of Medical Sciences/ China	Retrospectiv e
A29	FROHMADE, T.J.; LIN, F; CHABOYER, W./2015	Nursing Open./Australia	Qualitative
A30	GROSSMAN, J.A.C.;/2015	Clin Nurs Res./USA	Randomized
A31	HANSEN, T.B.; ZWISLER, A.D.; BERG, S.K.; SIBILITZ, K.L.; BUUS, N.; LEE, A./2015	J Adv Nurs /Denmark	Qualitative
A32	TURK-ADAWI, K.I.; TERZIC, C.; BJARNASON-WEHRENS, B.; GRACE, S./2015	BMC Health Services Research /Canada	Transversal
A33	CARTLEDGE,S.H.; BRAY, J.E.; STUB, D.; KRUM, H.; FINN, J. /2016	J Adv Nurs /Australia	Transversal
A34	GHOLAMI, M.; KHOSHKNAB, M.F.; KHANKEH, H.R.; AHMADI, F.; MADDAH, S.S.B.; ARFAA, N.M./2016	Iran Red Crescent Med J. /Iran	Qualitative
A35	LAMBERTI, M.; RATTI, G .; GERARDI, D.; CAPOGROSSO, C.; RICCIARDI, G.; FULGIONE, C.; LATTE, S.; TAMMARO, P.; COVINO, G.; NIENHAUS,A.; GARZILLO, E.M.; MALLARDO, M.;CAPOGROSSO, P./2016	International Journal of Occupational Medicine and Environmental Health /Italy	Quantitative
A36	Meng, K.; Musekamp, G.; Schuler,M.; Seekatz, B.; Glatz, J.; Karger, G.;	Patient Educ Couns /Germany	Randomized

A37	CARO, A.J.M.; FERNÁNDEZ, M.L.M.; PACHECO, J.D.; AYLLON, M.M.; LAFARGA, M.P.; GARCÍA, L.S./2017	Geriatr Nurs. /Spain	Descriptive
A38	CONNOLLY, S.B.; KOTSEVA,K.; JENNINGS, C.; ATREY,A; JONES,J.; BROWN,A.; BASSETT,P.;WOOD, D.A./2017	Heart /UK	Quantitative
A39	DHALIWAL, K.K.; KING-SHIER, K.; MANN, B.J.; HEMMELGARN, B.R.; STONE, J.A.; CAMPBELL, D.J.T./2017	BMC Cardiovascular Disorders/ Canada	Qualitative
A40	FEINBERG, J.L.; RUSSELL, D.; MOLA, A.; TRACHTENBERG, M.; BICK, I.; LIPMAN, T.H.; BOWLES, K.H./2017	Geriatric Nursing /USA	Quantitative
A41	VIEIRA,a.; Gabriel, J.; MELO, C.; MACHAO, J./2017	J Engineering in Medicine/Portugal	Near-experi mental
A42	WESTLAND, H.; BOS-TOUWEN, I.D.; TRAPPENBURG. J.C.A.; SCHRÖDER, C.D.; WIT, N.J.; SCHUURMANS, M.J./2017	Trials /Netherlands	Randomized

When characterizing the studies analyzed, it was identified that 19 of the publications originated from the countries of the American continent, however the geographical distribution was quite varied, also containing publications from Europe (11), Oceania (6), Asia (4) and Africa (2), which means that the theme is of interest to several places in the world.

Regarding the professional category of the authors of the research, of the analyzed productions, 28 were performed by nurses as the main authors of the medical category 13; and also 1 physiotherapist. This demonstrates that nurses are looking to improve knowledge related to their area of expertise.

Regarding the type of study, classified with levels of evidence (NE), according to the Oxford Center for Evidence-based Medicine - Levels of Evidence (2011), the qualitative type was presented in eleven articles (NE 5); eight cross-sectional articles (NE 2), seven quantitative (NE 5), six randomized (NE 1), two quasi-experimental (NE 2), two systematic literature reviews (NE 1), one observational (NE 2), one retrospective (NV 2), bibliographic (NE 5) and descriptive (NE 5).

Regarding the year of publication of the analyzed studies, although the time frame was long, it is clear that they were concentrated in the last ten years. This is due to the progress that the theme has been developing.

Regarding the empirical indicators, the objective of this work, they are observable characteristics that indicate the CVR, which are illustrations of the critical and consequent attributes [11]. In **Figure 3**, the RCV concept empirical indicators are presented according to Roy's adaptive modes.

Figure 3. Empirical indicators of the RCV concept according to Roy's adaptive modes. Fortaleza (CE), 2018.

Physiological Mode	Functional independence of patients through self-care [12].
	Effective care with diet. [13,14]
	Regular physical activity. [15, 13]
	Functional potential and physical autonomy. [13]
	Minimizes the risk of recurrence of cardiovascular events. [13,16]
	Drug adherence.[15, 17]
	Better Blood Pressure Control.[5]
	Weight control. [15]
	Capillary Glucose Control.[15]
	Smoking cessation.[15, 14]
Self-concept mode	Decreased feelings of uncertainty.[15]
	Knowledge about the health-disease process.[13]
	Self-awareness.[18]
	Depression.[14]
	Self-management.[19]
	Emotional autonomy.[13]
Roleplaying mode	Emancipation in society.[12]
	Better interpersonal relationships with peers.[13]
	Social autonomy.[13]
Interdependence mode	Enables greater confidence in health services.[13, 16]
	Improvement in self-care.[18]

The empirical indicators presented demonstrate that the RCV concept is observable through verbalizations, application of scales, questionnaires and continuous assessment of care, and can be guided by nursing theories, in order to contribute to the subject's autonomy and advancement in Nursing science.

Nursing is one of the professions that must actively act in the rehabilitation process, with therapeutic care as one of the purposes, based on the understanding of the other as being integral and autonomous. The nurse must restore the patients, as Florence Nightingale said, treating the sick to become healthy again. [20]

In this perspective, it can be seen, from the conclusions of the articles referring to the CVR, that this is an important care process. In addition, this should be started in the hospital environment, aiming at the recovery of the functional capacity of these individuals. Although not innovative, rehabilitation differs because it helps patients with heart disease to improve their physical, mental and social conditions, resulting in a more productive and active life in society. [13]

From the review carried out, two ways of evaluating the empirical indicators of RCV were identified, namely the Scale of Rehabilitation Barriers and the Borg Scale. The Cardiac Rehabilitation Barriers Scale consists of four subscales: perceived need / health factors, logistical factors, work / time conflicts and comorbidities / functional status. [21]

The Scale of Barriers to Cardiac Rehabilitation was validated in Brazil by Ghisi who, through a literature search identified three other scales (psychometrically validated) that assessed barriers both in participation and in adherence to CVR: one English (Beliefs about Cardiac Rehabilitation), an Australian (Cardiac Rehabilitation Enrolment Obstacles-CREO) and a Canadian (Cardiac Rehabilitation Barriers Scale-CRBS). [22]

The Cardiac Rehabilitation Barriers Scale (CRBS) was developed in Canada and had already been validated in two languages (English, French) and now in Portuguese. The CRBS scale can be used to examine the reasons that lead patients with cardiovascular problems not to use CVR, even when this treatment is indicated by health professionals. [22]

The Borg Scale is a widely validated scale for identifying exercise intensity. It was created exactly with the objective of establishing relationships between the Perception

of Effort (PE) and the objective data of external load, or physiological stress. [23]

In this context, the literature presents other ways of measuring the empirical indicators of CVR presented here. Regarding the social and psychological context, the application of the "Hospital Anxiety and Depression Scale (HADS)" and the summary mental component of the "Medical Outcomes Study Short Form - 36 (SF-36)" scale was identified, with the objective of evaluating the level of depression presented by patients in CVR.[24]

The Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI), have been validated for the Brazilian population and can also be applied to assess the symptoms of depression and anxiety of patients in RCV. These scales consist of self-report analyzes with 21 multiple-choice items, presented in the form of statements.[25]

Regarding the perception of heart disease, it is observed the use of the Illness Perception Questionnaire - IPQ-R questionnaire, which, in its different versions, has been adequate to measure the perception of heart disease. It comprises all dimensions for the assessment of the disease perception construct, more specifically its causes, treatment, duration, control / cure and emotional aspects of patients.[26]

Regarding the Quality of Life (QOL) of patients in CVR, the use of the Medical Outcome Study Short Form -36 (MOS SF-36) quality of life questionnaire has been noticed, which allows monitoring health conditions before and after the instituted treatment, being sensitive to clinical improvement. [27]

And the MacNew Quality of Life after Myocardial Infarction Questionnaire (MacNew QLMI), which evaluates the perception of QOL in a quantitative way, whose recommended score involves the emotional, physical and social domain. It consists of questions about mood, self-esteem, stress, disposition, independence, sexuality, confidence regarding the heart problem, presence of chest pain, physical capacity, among others. [28]

The Barthel Index (IB) was also identified as an instrument that assesses the person's level of independence for performing ten Daily Life Activities (ADL's) eating, personal hygiene, using the toilet, bathing, dressing and undressing, control sphincters, walking, transferring from chair to bed and going up and down stairs. [29]

In addition to those identified in the IR regarding the physical aspects / exercises, the application of functional physical tests can be highlighted, which have been considered essential components in the clinical routine of assessing exercise capacity. Among them, the cardiopulmonary test (TCP) is cited, considered the ideal to assess maximum exercise tolerance and determine the etiology of exercise limitation, providing more specific information on functional capacity and physiological adaptation in the face of these individuals' physical effort. However, due to the high cost and complexity of the equipment, it is still little used outside major research centers and is far from being effective, especially for the reality of the Brazilian public health service.[30]

The authors point out that as alternative forms of assessment to the maximum tests, the submaximal functional tests stand out, as they are easy to perform, low complexity options, in addition to not requiring high-cost equipment, being easy to apply in clinical practice. The highlights are the six-minute walk test (6MWT), the six-minute step (6MWT) and the chair, used in clinical practice for functional assessment of exercise tolerance, training prescription and to assess changes observed after a physical training program at RCV. [30]

The cardiorespiratory exercise tests (ergospirometry or Cardiopulmonary Test), which aim to analyze the expired gases during physical exercise, being necessary to consider the perception of tiredness, in the sense that the patient expresses his level of muscular or respiratory tiredness and the moment for the interruption of effort.[25]

In this sense, CVR improves the functional capacity and efficiency of the cardiorespiratory system, since of the 37 patients evaluated in a study conducted with people on CVR, there was an increase of 14% in peak V'O2 and 9.2% in pulse rate. oxygen ($p = 0.005$). The investigation observed an increase in the maximum heart rate of 6.2%, in the recovery rate of 2.4% and in the maximum systolic blood pressure of 6%. There was a reduction in serum levels of total cholesterol, LDL-c fraction, triglycerides, glucose, hemoglobin-glycate and elevation of the HDL-c fraction.[25]

In this perspective, when reflecting on the empirical indicators identified and organized according to Roy's adaptive modes, one can understand the relevance that the observable characteristics of CVR have for clinical practice, considering that interventions can be implemented and results positive results achieved.

CONCLUSIONS

To list the empirical indicators, an integrative literature review was carried out, using Roy's Adaptation Model as a theoretical framework, in which the author classifies in adaptive modes: Physiological mode, self-concept mode, role performance mode, interdependence mode.

After the search, the findings were organized according to the modes presented, addressing the person's physical, social and psychological aspects in CVR.

The realization of this research made it possible to recover theoretical knowledge in relation to the RCV process, which leads to the need to know the empirical indicators of this concept in order to make it possible to recognize when RCV is fully, partially or not attained.

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***Corresponding Author:**
Maria Sinara Farias
Avenida Comodoro Estácio Brígido, 2800
Luciano Cavalcante, Fortaleza, CE, Brasil
E-mail: sinarafariasbc@gmail.com
Telephone: +55 (88) 99715-8801
CEP: 60.813-670

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