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Analysis of the concept of cardiovascular risk: contributions to nursing practice

Análise do conceito de risco cardiovascular: contribuições para a prática de enfermagem

Análisis del concepto de riesgo cardiovascular: contribuciones a la práctica de enfermería

Nuno Damácio de Carvalho Félix[I,II]
ORCID: 0000-0002-0102-3023

Brenda Silva Cunha[II]
ORCID: 0000-0003-2463-4705

Maria Naiane Rolim Nascimento[III]
ORCID: 0000-0001-9115-1485

Douglas Vieira Braga[IV]
ORCID: 0000-0003-1700-4721

Célida Juliana de Oliveira[IV]
ORCID: 0000-0002-8900-6833

Marcos Antônio Gomes Brandão[V]
ORCID: 0000-0002-8368-8343

Alba Lucia Bottura Leite de Barros[VI]
ORCID: 0000-0003-2691-3492

Maria Miriam Lima da Nóbrega[I]
ORCID: 0000-0002-6431-0708

[I]*Universidade Federal da Paraíba. João Pessoa, Paraíba, Brazil.*
[II]*Universidade Federal do Recôncavo da Bahia. Santo Antônio de Jesus, Bahia, Brazil.*
[III]*Universidade Federal do Ceará. Fortaleza, Ceará, Brazil.*
[IV]*Universidade Regional do Cariri. Crato, Ceará, Brazil.*
[V]*Universidade Federal do Rio de Janeiro. Rio de Janeiro, Rio de Janeiro, Brazil.*
[VI]*Universidade Federal de São Paulo. São Paulo, São Paulo, Brazil.*

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Corresponding author:
Nuno Damácio de Carvalho Félix
E-mail: nunof05@hotmail.com

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ABSTRACT

Objectives: to analyze the concept of cardiovascular risk to support nursing practice. **Methods:** this is an analysis to define the concept of cardiovascular risk, through the use of eight steps of Walker's and Avant's framework, using a literature review in indexed scientific journals. **Results:** cardiovascular risk is defined in a broad and original way as a context of health and nursing care that makes it possible to identify modifiable (cardiometabolic, behavioral, psychosocial, cultural and occupational) and non-modifiable (biological) risk factors for cardiovascular diseases that act as early and interrelated markers, of multiple and heterogeneous etiology, predisposing to cardiovascular vulnerability. **Conclusions:** with the analysis and definition of the concept of cardiovascular risk, we realized that it will be possible to base nursing practice, with implications in clinical practice for identifying and reducing risk factors for cardiovascular diseases, with nursing relevance in the care of these subjects. **Descriptors:** Nursing; Concept Formation; Risk; Heart Disease Risk Factors; Cardiovascular Nursing.

RESUMO

Objetivos: analisar o conceito de risco cardiovascular para fundamentar a prática de enfermagem. **Métodos:** trata-se de uma análise para definição do conceito de risco cardiovascular, por meio da utilização de oito etapas do referencial de Walker e Avant, utilizando uma revisão da literatura em periódicos científicos indexados. **Resultados:** define-se o risco cardiovascular de forma ampla e original como contexto de saúde e de cuidado de enfermagem que permite identificar fatores de risco para doenças cardiovasculares modificáveis (cardiometabólicos, comportamentais, psicossociais, culturais e laborais) e não modificáveis (biológicos), que atuam como marcadores precoces e inter-relacionados, de etiologia múltipla e heterogênea, predispondo à vulnerabilidade cardiovascular. **Conclusões:** com a análise e definição do conceito de risco cardiovascular, percebemos que será possível fundamentar a prática de enfermagem, com implicações na prática clínica para identificação e redução dos fatores de risco para doenças cardiovasculares, com protagonismo da enfermagem no cuidado desses sujeitos.
Descritores: Enfermagem; Formação de Conceito; Risco; Fatores de Risco de Doenças Cardíacas; Enfermagem Cardiovascular.

RESUMEN

Objetivos: analizar el concepto de riesgo cardiovascular para apoyar la práctica de enfermería. **Métodos:** se trata de un análisis para definir el concepto de riesgo cardiovascular, mediante el uso de los ocho pasos del marco Walker y Avant, utilizando una revisión bibliográfica en revistas científicas indexadas. **Resultados:** el riesgo cardiovascular se define de manera amplia y original como un contexto de salud y cuidado de enfermería que permite identificar factores de riesgo modificables (cardiometabólicos, conductuales, psicosociales, culturales y laborales) y no modificables (biológicos) de enfermedades cardiovasculares, que actúan como marcadores tempranos e interrelacionados, de etiología múltiple y heterogénea, que predisponen a la vulnerabilidad cardiovascular. **Conclusiones:** con el análisis y definición del concepto de riesgo cardiovascular, percibimos que será posible fundamentar la práctica de enfermería, con implicaciones en la práctica clínica para la identificación y reducción de los factores de riesgo de enfermedades cardiovasculares, con protagonismo de enfermería en el cuidado de estas asignaturas.
Descriptores: Enfermería; Formación de Conceptos; Riesgo; Factores de Riesgo de Enfermedad Cardiaca; Enfermería Cardiovascular.

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INTRODUCTION

Cardiovascular diseases are the leading cause of death in the world. It was estimated that in 2019 there were about 17.9 million deaths from this reason, with more than three-quarters in low- and middle-income countries[1]. They are responsible for the impact on the economy and social security, as well as on the population's quality of life, reducing productivity, increasing absenteeism and the demand for health services[2-3]. Literature emphasizes that, in the absence of risk factors, cardiovascular diseases would be a rare cause of death, representing a great advance in world population health[2].

Since 1960, with the initial results of the Framingham Heart Study team, cardiovascular risk has been highlighted in terms of the importance of so-called "classic" risk factors for cardiovascular diseases, such as smoking, hypertension, diabetes mellitus, dyslipidemia, obesity and physical inactivity[4]. In 1998, the joint use of risk factors was synthesized, in which it is possible to identify cardiovascular risk by sex and age group, by the value of systolic blood pressure, total cholesterol, HDL-c (High-density lipoprotein) fraction, diagnosis of diabetes and smoking, stratifying the risk of developing coronary heart disease in the next decade of life[5].

Cardiovascular risk is defined as aspects of personal behavior or lifestyle, environmental exposure, hereditary conditions and characteristics, which are determined to be associated with heart disease[6]. However, the definitions of this concept are multiple and different, often incomplete and segmented, restricted to current cardiovascular risk scores, with biomedical parameters and that may not present satisfactory and comprehensive accuracy in the prediction of cardiovascular events.

Considering the advance in knowledge about cardiovascular risk factors, the authors of this study question that the current definition shows a biomedical conceptual limit. There is a need to analyze the elements of the aforementioned concept (attributes, antecedents, consequents and definitions), as it is understood that there are important variables that are not included in the definition. An analysis proposal is presented considering the classic risk factors, but with an emphasis on paradigmatic change, especially in the field of nursing.

The World Health Organization (WHO) already emphasizes in its publications on the prevention of cardiovascular diseases with an approach based on risk factors, especially behavioral ones[1]; however, the analysis of the concept of cardiovascular risk is necessary to give greater guidance to health professionals' work, especially nurses, considering that these professionals play a direct role in health promotion and disease prevention.

Thus, there is a gap in knowledge in which the concept is centered on behavioral factors. Other factors may be relevant and need to be analyzed in the knowledge already produced, enabling the recognition of broader traits of the concept, evidenced in the field of nursing, such as the understanding of when cardiovascular risk should be identified and be amenable to nursing interventions to promote health and reduce morbidity and mortality from cardiovascular diseases.

The broad identification of risk factors, based on an analyzed concept, can allow nurses to plan and implement individualized actions aimed at the needs of people with potential cardiovascular injury[7]. This fact requires critical analysis, with scientific rigor, to contribute to the advancement of knowledge of the concept, in a global format for identifying and implementing effective interventions for reducing cardiovascular risk factors[8], as ill-defined or incomplete concepts can compromise the construction of accurate instruments and related research methods[9].

OBJECTIVES

To analyze the concept of cardiovascular risk to support nursing practice.

METHODS

Ethical aspects

This research was approved by the Research Ethics Committee of the *Universidade Federal da Paraíba*.

Study design, period, and place

It is a conceptual analysis, carried out through the use of eight steps (concept selection; objective definition; possible use identification; attribute determination; model case; additional case; antecedents and consequents; empirical references of the concept), according to Walker's and Avant's framework[10], for analysis of the concept of cardiovascular risk. The choice of this reference is justified by the fact that it is the most used in research in the field of nursing, including steps that describe the concept components and use to facilitate its understanding and use in the foundation of professional nursing practice.

The study was carried out by researchers from northeastern and southeastern Brazil, between 2018 and 2021, as an initial step towards the construction of a medium-range theory, derived from the aforementioned concept analyzed in the field of nursing that composed the main author's doctoral thesis.

Concept analysis involves rigorous processes to bring clarity to the definition, used in science, in general, broken down as to the level of development, its internal structure, use, representativeness and relationship with other concepts to promote understanding[11]. The study was carried out through an integrative literature review in nursing[12], through the Preferred Reporting Items for Systematic Reviews and Meta Analyzes (PRISMA)[13] as a more structured concept analysis strategy, compared to the strategy of academic criticism and careful definition[11].

Study protocol

The first step involved selecting the concept of cardiovascular risk as a conceptual problem. The second step established the delimitation of the objective of this study, presented in introduction.

The third step involved the identification of possible use of the concept through literature review[12] as a more structured concept analysis strategy, comparing the academic criticism strategy and careful definition[11]. Thus, the review of scientific documents, presented through the link in the supplementary material, is intended to provide a robust empirical basis for conceptual analysis, with no objective of mapping or synthesizing knowledge

in literature in nursing. To this end, the criteria for identifying use in scientific articles were considered: being produced by nurses and/or published in nursing journals or related areas; directly contemplate the concept in the content; clearly present the concept in the title and/or in the article development; expose relevant data for concept analysis composition.

An integrative literature review was carried out, according to pre-established steps[12]. The PCC strategy was used, which represents an acronym for population of concept and context, respectively, being: P – individuals; C – cardiovascular risk; and C - nursing[14]. The "AND" operator and controlled descriptors indexed in Medical Subject Headings (MeSH) and Health Sciences Descriptors (DeCS) were used. MeSH/DeCS in English and Portuguese were used: "Nursing", "Heart Disease Risk Factors", "*Enfermagem*", "*Fatores de Risco de Doenças Cardíacas*".

The paired search for articles took place between January and May 2021, in the Medical Literature Analysis and Retrieval System Online (MEDLINE via PubMed), Web of Science (WoS), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Scopus databases, accessed through the Portal of Journals of the Coordination for the Improvement of Higher Education Personnel (CAPES - *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*), and in the Latin American Literature in Health Sciences (LILACS) and *Índice Bibliográfico Español en Ciencias de la Salud* (IBECS) databases, accessed via Virtual Health Library (VHS), and Scientific Electronic Library Online (SciELO) journal repository.

The search and selection processes of articles, specifically, followed the PRISMA guidelines[13], detailed in Figure 1. After the search procedure, selected articles' titles and abstracts were read to verify if they met the established inclusion criteria, and then a thorough reading was performed.

In the studies identified by a review, we sought to use and define the concept selected in the field of nursing, a *sine qua non* condition for inclusion in the study. Full text articles in English, Portuguese and/or Spanish, indexed in the last 15 years, with human beings regardless of age group, with population group or correlation with diseases were included. The indexing time is justified, considering that it is the ascending period of publication on the concept of cardiovascular risk. Editorials, theses, dissertations, points of view and case studies were excluded from the study, considering the high quantity of original articles identified.

The fourth step involved determining the selected concept's essential attributes, which are terms that are repeated in the literature and emphasize the concept essence[9], making use of the question: how do the authors define the concept of cardiovascular risk? A data collection instrument was used, designed with the characterization of the concept's empirical references and essential attributes.

The fifth step involved the model case construction, understood as an example of the use of the concept that demonstrates the attributes[10]. The sixth step involved building an additional case. In this study, the opposite case was constructed, understood as an example of "non-concept", useful in the decision regarding the concept's essential attributes[10].

The identification of antecedents and consequents referring to the seventh step occurred through the following question: what habits, attitudes, events, situations and phenomena contribute to the development of cardiovascular risk? What characteristics and particularities were pointed out by the authors? What are the consequences of establishing and not monitoring people with cardiovascular risk?

The eighth step involved the definition of empirical references, to elaborate an operational definition of the concept of cardiovascular risk.

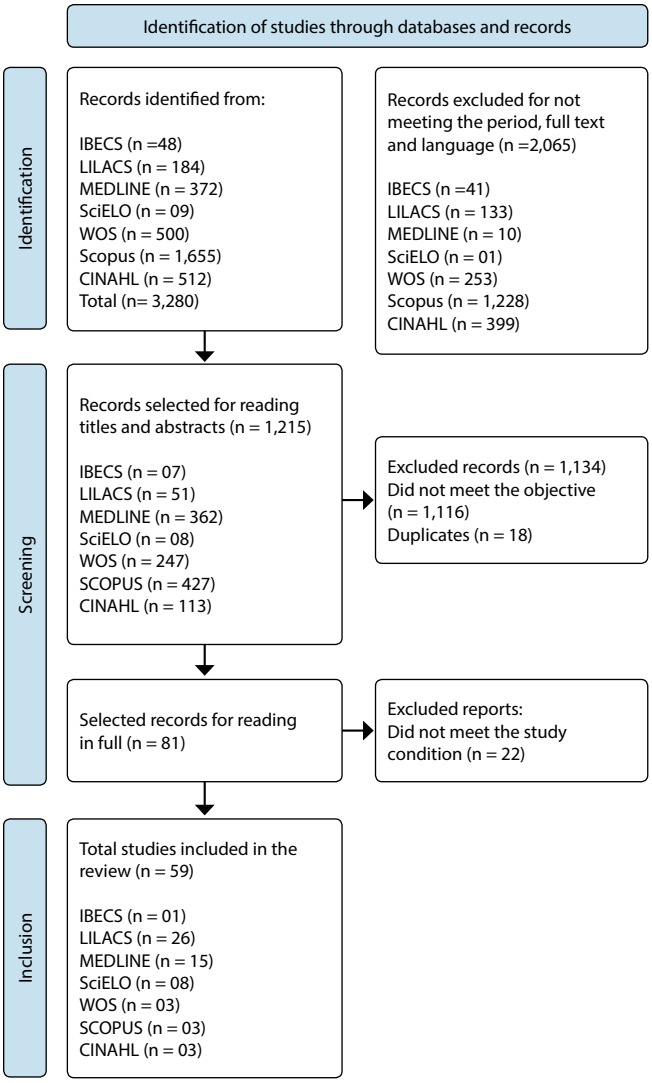

Figure 1 - Procedure for identifying and including studies in the cardiovascular risk concept analysis using the PRISMA strategy, João Pessoa, Paraíba, Brazil, 2021

Analysis of results

The data extracted and analyzed were divided into categories and subcategories, in which the *essential attributes* of cardiovascular risk category was composed of concept characteristic, organized into subcategories as to the potential for change or not. The *antecedents* and *consequents* categories were organized according to relevance and temporal aspect (short, medium and long term), respectively. Antecedents are incidents or events that occur before the concept (cardiovascular risk), being necessary for its occurrence. Consequents are the situations or events that occur after the analyzed concept's attributes[10].

RESULTS

The concept was analyzed from 59 original articles, with a prevalence of indexation in LILACS (44.1%), with a majority between 2014 and 2017 (55.9%), as shown in the supplementary material. The various ways of defining the concept analyzed in articles in nursing were evidenced, with the expression cardiovascular risk prevailing as risk factors for cardiovascular diseases that the human being's life, according to Chart 1.

The following cases were constructed: the model, understood as an example of the use of the concept that demonstrates the attributes, and the additional (contrary), for a better decision regarding the essential attributes of the concept of cardiovascular risk, as it represents the "non-concept", namely: model case: J.N.S., 30 years old, female, white, bus driver, incomplete high school, income of two minimum wages. Family history of hypertension and type 2 diabetes mellitus. Smoker, alcoholic, overweight and physically inactive. She is anxious and stressed during the nursing consultation. Anthropometric and laboratory data: 1.75 height, body weight 76 kg, BMI (Body Mass Index) 24.8 kg/m^2, capillary blood glucose 96 mg/dl, blood pressure 130x80 mmHg (pre-hypertension). High appetite (+5x/day). Refers to consumption of fried foods, excess salt, animal fat, condiments and soft drinks. No compliance with the therapeutic regimen or attitudes towards cardiovascular self-care. Does not seek the health service often; contrary case: S.A.A., 26 years old, male, white, athlete, complete higher education, income of four minimum wages. Denies family history of cardiovascular disease. He says he does not use tobacco and alcohol. Eutrophic and active lifestyle. Anthropometric and laboratory data: height 1.80 m, body weight 72 kg, BMI 22 kg/m^2, capillary blood glucose 78 mg/dl, blood pressure 122x76 mmHg (normal). Normal appetite. Refers to the consumption of fruits, vegetables, whole grains, with little salt. He is routinely accompanied by a health team that assesses his cardiovascular health.

In line with the concept analysis steps, empirical references of the concept of cardiovascular risk (Chart 2) are presented, related to essential attributes, antecedents and consequents in the short, medium and long term, to be clearly evidenced in research and in practice and health.

Chart 1 - Examples of definitions of the concept of cardiovascular risk by the analyzed articles' authors, João Person, Paraíba, Brazil, 2021

Definitions of the concept of cardiovascular risk
Risk factors for cardiovascular diseases and other chronic comorbidities, susceptible to change and controlled to reduce mortality. Modifiable and non-modifiable, inherent to the individual or the community. Biological signs and acquired habits that allow the identification of groups at higher risk of presenting cardiovascular disease in the coming years. Any existing situation, development or event that predisposes an individual to cardiovascular disease, measured as a factor indicative of health problems and need for care. Characteristics or conditions present early that are associated with the probability of developing coronary or cardiovascular disease in a given period. Early markers of cardiovascular disease related to patient sociodemographic and clinical characteristics. Perceived risk and predisposing, facilitating and reinforcing factors for cardiovascular diseases. Health context that contributes to the occurrence of cardiovascular diseases, minimized by improving the population's quality of life; when associated, determines cardiovascular diseases, requiring rehabilitation.

Chart 2 - Essential, antecedent and consequent attributes of the concept of cardiovascular risk, João Person, Paraíba, Brazil, 2021

Antecedents	**Attributes**	**Consequents**
Changes in the economic, political, social and cultural areas, which cause deterioration of living conditions Limitation in access to and availability of health services Unfavorable socioeconomic and educational condition Lack of knowledge about measures to prevent and control cardiovascular risk factors Populational epidemiological profile	Risk factors for cardiovascular disease Early and interrelated markers in a health context Multiple and heterogeneous etiology Individual's and community's vulnerability *Non-modifiable factors* **Biological factors:** Sex, age, race and ethnicity and genetics Family history of cardiovascular disease Personal history of hypertension and/or diabetes mellitus *Modifiable factors* **Cardiometabolic factors:** Overweight and obesity Dyslipidemia Increased blood pressure and blood glucose **Behavioral factors:** Smoking Sedentary lifestyle Inadequate diet Excessive intake of alcohol and salt Low compliance with treatment Illicit drugs **Psychosocial and cultural factors:** Anxiety and stress **Labor factors:** Inadequate work environment and activity	*Short term* Need for interdisciplinary cardiovascular health care Impairment of quality of life Limitations on work and leisure activities Economic impact *Medium and long term* Cardiovascular and cerebrovascular diseases Complications of pre-existing diseases and development of disabilities Sudden and/or premature death

Based on the analysis evidence, the case models and the empirical concept references, a definition for cardiovascular risk was produced, which is present in the context of health and nursing care, which allows the identification of groups with modifiable (cardiometabolic, behavioral, psychosocial, cultural and occupational) and non-modifiable (biological) risk factors for cardiovascular diseases, that act as early and interrelated markers, of multiple and heterogeneous etiology, which predispose subjects to vulnerability.

DISCUSSION

The elements resulting from an analysis point to the multidimensionality of the concept of cardiovascular risk and the necessary articulation for conceptual understanding with a focus on the health-disease continuum. An excessive focus on one of the poles of this relationship can either be a reduced interpretation of the concept or lead to a pragmatic and insufficient problem-solving. The expressive number of articles included in our study allowed a broad view of knowledge produced in national and international scenarios, from 2009 to 2020.

Authors[15] state that the term *cardiovascular risk factor* is commonly used to explain any existing situation or event that predisposes or may predispose to cardiovascular disease. This statement goes against our findings, which, in turn, expand the variety of risk factors, as well as allow the expansion of the concept, not necessarily being related only to the occurrence of a disease. Thus, the importance of the results of this conceptual analysis is reaffirmed, based on evidence of scientific support, so that they can be disseminated and used in health practice, as proposed by this study.

When examining the concept use in literature, we observed limitations regarding the full definition of the concept of cardiovascular risk, with little ability to contribute significantly to the elucidation and objective approach of this theme as a demand referred to in literature[8]. The concept is rigorously analyzed, as the references point out, which is evidenced when comparing the definition presented in this study with the definition contained in the controlled vocabulary of national and international implication[6]. The analyzed concept potentially impacts nursing care directed to the population with cardiovascular risk, with scope of interprofessional practice in health services, in various contexts, especially in Primary Health Care, in which we observe the context of disease prevention and health promotion being worked on.

Society tends to interpret cardiovascular risk factors as cardiovascular diseases themselves[16], which can compromise the implementation of effective interventions in the context of disease prevention and health promotion. The relevance of the concept of cardiovascular risk is highlighted, as the components and in-depth definition are presented, which can facilitate efficient and holistic nursing and health care. In the scope of nursing, the understanding of cardiovascular risk, through concept analysis, promotes the recognition of problems and responses of a person with cardiovascular risk that nursing deals with in everyday life.

The concept essential attributes were organized into non-modifiable and modifiable factors, which are close to the antecedents of metabolic syndrome[17], which we consider as a central phenomenon of cardiovascular risk, because this syndrome is not configured as a disease and because its identification criteria make it possible to investigate individuals more predisposed to developing cardiovascular diseases.

Biological non-modifiable factors are related to an individual's intrinsic life, inserted by the time of existence, genetics and/or heredity, with emphasis on personal history of hypertension followed by history of diabetes mellitus, as well as aspects related to sex, age, race and ethnicity. Authors[16] corroborate our findings, as they emphasize that knowing each person's history makes it possible to act on factors that are not perceptible through a simple interview.

A multiple cohort study, carried out in the city of São Paulo, Brazil between 2000 and 2010, identified a higher profile of cardiovascular diseases in older women. The most frequent skin color report was white, followed by self-report of brown skin color, having a relationship with biological cardiovascular risk, but also being correlated with the population's lifestyle[18]. In a research comparing self-reported data by telephone contact with data from clinical and laboratory tests, carried out in the Brazilian National Health Survey, which identified the prevalence of cardiovascular risk factors in the population of the city of Vitória, Espírito Santo, Brazil, indicated the prevalence in males only for smoking, with hypertension, diabetes, obesity and dyslipidemia being more prevalent in females[19-20].

American report, with global updates on cardiovascular disease mortality trends and traditional risk factors, states that non-modifiable cardiovascular risk factors are highly heterogeneous in middle and low-income countries, warning of a population risk profile. Therefore, actions based on health promotion and prevention of these diseases are demanded, through health education in lifestyle changes, directing care actions towards modifiable factors[21].

In the field of nursing, the findings of this study point to cardiovascular risk factors that are not recognized in clinical practice, due to lack of clarity and completeness of the concept regarding factors that can predispose an individual to a situation of cardiovascular risk, extrapolating the classic factors and centered on the biomedical perspective. As these are non-modifiable factors, we nurses need to know them to modulate the impact they can have on people's health, considering individualities and the collective context.

As for modifiable factors, life habits stand out, as they add fundamental value to the good of biopsychosocial and spiritual health and impact an individual's life. Cardiometabolic factors are very close to metabolic syndrome attributes[17]. Behavioral factors, such as the use of tobacco and alcoholic beverages, inadequate diet and non-compliance with physical activities, are relevant when understood as essential attributes for the concept of cardiovascular risk. Alcohol and tobacco abuse are directly associated with personal behaviors and beliefs, being generally related to socioeconomic issues, influencing aspects of work, leisure, family and life habits[22].

Literature refers to the cardiovascular health of men who are more likely to have a greater set of cardiovascular risk factors, such as smoking, a very frequent attribute in the research, and obesity and/or overweight, factors that were highly frequent in this study[23]. Regarding overweight, authors highlight the importance of nurses to develop strategies that involve educational practices, aiming at preventing this clinical situation, seen as a risk factor for other chronic comorbidities, such as cardiovascular diseases[24].

The greater exposure of males to cardiovascular risk factors may also be related to the social idea that women tend to take more

care of their health than men. Several actions can be coordinated by nurses to reduce these factors in the general population, with the implementation of public policies aimed at men's health and related to cardiovascular risk factors.

The risk factors included in attributes are, for the most part, modifiable, since they are strictly related to lifestyle habits that generate health benefits. Authors[25] infer that, even in a population with a high level of knowledge about these factors, there is still an increasing prevalence of cardiovascular risk factors. As for work factors, the association between work process and cardiovascular risk was assessed by a systematic review and meta-analysis[26], presenting itself in a non-linear way and starting after the first five years of inadequate occupational exposure, with demands for specific actions to reduce risk to workers, data that converge with the result of this study.

Conceptual antecedents relate to demands in the educational, labor, economic, social, cultural and political spheres, and are directly related to living conditions, so that if one is negatively affected, the other tends to be too, culminating in the need for access and availability of health services.

People's knowledge of risk factors is not enough to correct their behavior, because, when seeking the service, are faced with low quality in service delivery and/or difficulty in infrastructure or lack of health policies aimed at promoting cardiovascular health[27]. We note that there is a lack of knowledge about prevention and control measures of risk factors as a cardiovascular risk antecedent, as well as unfavorable socioeconomic and educational status.

The educational factor is indicated by literature as a risk factor with a comprehensive global effect, not depending on the country's economic and social level. It is also understood that the populational epidemiological profile is correlated with the place where individuals are located, presenting a direct relationship with the main problems existing in a territory[28-29].

That said, the short-term consequents are related to a significant impairment in quality of life, since they provide a change in reality and in the way in which the consequences of cardiovascular risk occur. As for the medium and long term, there is expressiveness of cardiovascular diseases, corroborating the incessant search for theoretical knowledge to support health professionals' work.

Thus, the analysis of the concept and the definition presented in this study contribute to the construction of a theoretical foundation for the phenomena and factors inserted in the context of cardiovascular risk, with economic, social and political impact, structured and implemented by nurses. Likewise, it allows the inclusion of other cardiovascular risk factors, to be inserted in the future, through research and wide scientific dissemination.

It is contributory and fundamental to the development of nursing theories, being substantial for the creation of focal theories, such as middle-range theories and theories of specific situation, which can use the present conceptual analysis in their process. Concerning the implications for nursing, we have the theoretical support that will impact health services, increase the quality of life of users and the creation of new programs, groups, which will contribute to the creation of new specific public health policies for people with cardiovascular risk, encompassing all its breadth that we discuss in this study. All this can be measured by existing health indices and the stimulus for the elaboration of new ones, if necessary.

Study limitations

A limitation is the possibility of not having considered all the cardiovascular risk factors that are established in the literature, in addition to the fact that this concept is constantly linked directly to cardiovascular disease. Another limiting point is the fact that a definition of a concept is something mutable, i.e., in a few years, further studies may be needed to analyze the evolution that has occurred over time with the concept of cardiovascular risk.

Contributions to nursing

As an implication, there is an advance in knowledge about cardiovascular risk, through conceptual analysis with methodological rigor, enabling a comprehensive and objective understanding in the field of nursing. There is the potential to complement the definition of controlled vocabularies, to build theories and protocols for clinical practice in nursing and health, focusing on health promotion development and cardiovascular disease prevention.

CONCLUSIONS

It was possible to analyze and define the concept of cardiovascular risk. We present relevant attributes that point to a context of health and nursing care that allows identifying modifiable (cardiometabolic, behavioral, psychosocial, cultural and occupational) and non-modifiable (biological) risk factors for cardiovascular diseases, which act as early and interrelated markers, of multiple and heterogeneous etiology, which predispose to cardiovascular vulnerability.

With the analysis and definition of the concept of cardiovascular risk, we realized that it will be possible to base nursing practice, as it is comprehensive and involves multiple attributes, as relevant risk factors, composed of psychosocial, cultural, work and therapeutic dimensions with similar and additional risk factors in relation to those pointed out in literature. Therefore, there are implications in clinical practice for identifying and reducing risk factors for cardiovascular diseases, with nursing role in the care of these subjects.

We note, through the findings, the potential contribution in nursing practice, whether in practice or in theory, as it guides care directed to the identified factors with regard to a better understanding of cardiovascular risk, in order to avoid consequences in the short, medium and long term. Moreover, it can support the creation of nursing theories, protocols, standard procedures, in addition to subsidizing the creation of public policies focused on cardiovascular disease prevention and health promotion at the primary level, contributing to the advancement of knowledge about the analyzed concept and its refinement.

SUPPLEMENTARY MATERIAL

https://doi.org/10.48331/scielodata.IB7TJ1.

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REFERENCES

1. World Health Organization (WHO). Cardiovascular diseases (CVDs)[Internet]. 2021 [cited 2022 mar 04]. Available from: http://www.who.int/mediacentre/factsheets/fs317/en/
2. Roth GA, Mensah GA, Johnson CO, Addolorato G, Ammirati E, Baddour LM, et al. Global burden of cardiovascular diseases and risk factors: 1990–2019. JACC. 2020;76(25). https://doi.org/10.1016/j.jacc.2020.11.010
3. Katz IP, Smith JA, Norsen L, Devoe J, Singh R. Reducing cardiovascular disease risk for employees through participation in a wellness program. Popul Health Manag. 2019;12. https:/doi.org/10.1089/pop.2019.0106
4. Assmann G, Paul C, Helmut S. Simple scoring scheme for calculating the risk of acute coronary events based on the 10-year follow-up of the prospective cardiovascular Münster (PROCAM) Study. Circulation. 2002;105:310-15. https://doi.org/10.1161/hc0302.102575
5. Lotufo PA. O escore de risco de Framingham para doenças cardiovasculares. Rev Med. 2008;87(4):232-7. https://doi.org/10.11606/issn.1679-9836.v87i4p232-237
6. World Health Organization (WHO). Health Sciences Descriptors: DeCS[Internet]. São Paulo: 2017 [cited 2021 Jun 20]. Available from: https://decs.bvsalud.org/ths/resource/?id=59351&filter=ths_termall&q=risco%20cardiovascular
7. Mendez RDR, Santos MA, Wysocki AD, Ribeiro BDAB, Stauffer LF, Duarte SJH. Cardiovascular risk stratification among hypertensive patients: the influence of risk factors. Rev Bras Enferm. 2018;71(4):1985-91. https://doi.org/10.1590/0034-7167-2017-0528
8. Félix NDC, Nóbrega MML. Cardiovascular risk as a context of care. Int J Food Sci Nutr Diet [Internet]. 2020 [cited 2020 Jul 16];9(5):555772 Available from: https://juniperpublishers.com/nfsij/NFSIJ.MS.ID.555772.php
9. Morse JM. Exploring the theoretical bases of nursing using advanced techniques of concept analysis. ANS Adv Nurs Sci. 1995;17(3):31-46 https://doi.org/10.1097/00012272-199503000-00005
10. Walker LO, Avant KC. Strategies for theory construction in nursing. 6th ed. New York: Pearson; 2019.
11. McEwen M, Wills EM. Bases teóricas de enfermagem. 4. ed. Porto Alegre: Artmed, 2016.
12. Soares CB, Hoga LAK, Peduzzi M, Sangaleti C, Yonekura T, Silva DRAD. Integrative review: concepts and methods used in nursing. Rev Esc Enferm USP. 2014;48(2):335-45. https://doi.org/10.1590/S0080-6234201400002000020
13. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021;372:71. https://doi.org/10.1136/bmj.n71
14. Peters M, Godfrey C, McInerney P, Munn Z, Trico A, Khalil H. Chapter 11: Scoping Reviews. In: Aromataris E, Munn Z, organizadores. JBI Database System Rev Implement Rep. 2020. https://doi.org/10.46658/JBIMES-20-12
15. Pires CGS, Azevedo SQR, Mussi FC. Fatores de risco cardiovascular em estudantes de enfermagem: elaboração de procedimentos de avaliação. Rev Baiana Enferm. 2014;28(3):294-302. https://doi.org/10.18471/rbe.v28i3.10483
16. Machado MC, Pires CGS, Lobão WM. Concepções dos hipertensos sobre os fatores de risco para a doença. Ciênc Saúde Colet. 2012;17(5):1357-63. https://doi.org/10.1590/S141381232012000500030
17. Félix NDC, Nóbrega MML. Metabolic Syndrome: conceptual analysis in the nursing context. Rev Latino-Am Enfermagem. 2019;27:e3154. https://doi.org/10.1590/1518-8345.3008.3154
18. Massa KHC, Duarte YAO, Chiavegatto Filho ADP. Analysis of the prevalence of cardiovascular diseases and associated factors among the elderly, 2000-2010. Ciênc Saúde Colet. 2019;24(1). https://doi.org/10.1590/1413-81232018241.02072017
19. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Vigilância de fatores de Risco e proteção para doenças crônicas por inquérito telefônico (VIGITEL) [Internet]. Brasília: Ministério da Saúde. 2019 [cited 2022 Mar 05]. https://bvsms.saude.gov.br/bvs/publicacoes/vigitel_brasil_2019_vigilancia_fatores_risco.pdf
20. Borgo MV, Pimentel EB, Baldo MP, Souza JB, Malta DC, Mill JG. Prevalência de fatores de risco cardiovascular na população de Vitória segundo dados do VIGITEL e da Pesquisa Nacional de Saúde de 2013. Rev Bras Epidemiol. 2019;22. https://doi.org/10.1590/1980- 549720190015
21. Jagannathan R, Patel SA, Ali MK, Narayan KMV. Global updates on cardiovascular disease mortality trends and attribution of traditional risk factors. Curr Diab Rep. 2019;20(19-7);44. https://doi.org/10.1007/s11892-019-1161-2
22. Paredes ML, Hautala D, Gonzalez M, Greenfield B, Aronson BD, Onello E. Percepções e prevalência do uso de álcool e cigarro entre adultos indianos americanos com diabetes tipo 2. Clin Diabet. 2019;37(3):260-8. https://doi.org/10.2337/cd18-0078
23. Hirakawa Y, Ninomiya T, Kiyohara Y, Murakami Y, Saitoh S, Nakagawa H, et al. Age- specific impact of diabetes mellitus on the risk of cardiovascular mortality: an overview from the evidence for Cardiovascular Prevention from Observational Cohorts in the Japan Research Group (EPOCH-JAPAN). J Epidemiol. 2017;27(3):123-9. https://doi.org/10.1016/j.je.2016.04.001
24. Santiago JCS, Moreira TMM, Florêncio RS. Association between overweight and characteristics of young adult students: support for nursing care. Rev Latino-Am Enfermagem. 2015;23(2):250-8. https://doi.org/10.1590/0104-1169.0174.2549
25. Jardim TV, Sousa ALL, Povoa TR, Barroso WS, Chinem B, Jardim PCV. Comparação entre fatores de risco cardiovascular em diferentes áreas da saúde num intervalo de vinte anos. Arq Bras Cardiol. 2014;103(6):493-501. https://doi.org/10.5935/abc.20140150

26. Torquati L, Mielke GI, Brown WJ, Kolbe-Alexander T. Shift work and the risk of cardiovascular disease: a systematic review and meta-analysis including dose-response relationship. Scand J Work Environ Health. 2018;44(3):229-38. https://doi.org/10.5271/sjweh.3700

27. Negesa LB, Magarey J, Rasmussen P, Hendriks JML. Patients' knowledge on cardiovascular risk factors and associated lifestyle behaviour in Ethiopia in 2018: a cross-sectional study. PLoS One. 2020;15(6):e0234198. https://doi.org/10.1371/journal.pone.0234198

28. Powell KL, Stephens SR, Stephens AS. Cardiovascular risk factor mediation of the effects of education and Genetic Risk Score on cardiovascular disease: a prospective observational cohort study of the Framingham Heart Study. BMJ Open. 2021;11(1):e045210. https://doi.org/10.1136/bmjopen-2020-045210

29. Precoma DB. Education as a social determinant associated with cardiovascular risk. Arq Bras Cardiol. 2021;117(1):13-4. https://doi.org/10.36660/abc.20210444