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PHYSICAL ACTIVITY FOR CARDIOVASCULAR HEALTH OF ADULTS AND ELDERLY PEOPLE: LITERATURE REVIEW

Atividade física para a saúde cardiovascular de pessoas adultas e idosas: revisão de literatura

Actividad física para la salud cardiovascular en adultos y ancianos: revisión de literatura

Matheus Rodrigues de Carli[I]
Eliane Raquel Rieth Benetti[2]
Leonardo Bigolin Jantsch[3]
Oclaris Lopes Munhoz[4]
Silomar Ilha[5]

RESUMO

Objetivo: identificar as contribuições da prática de atividades físicas para a saúde cardiovascular de pessoas adultas e idosas. **Método:** estudo de revisão narrativa, com busca nas bases de dados Literatura Latino Americana e do Caribe em Ciências de Saúde; Base de Dados em Enfermagem e *Medical Literatura and Retrivial System Online*, por meio da Biblioteca Virtual da Saúde. Procedeu-se com a análise textual discursiva. **Resultados:** geraram uma categoria central, unitarizada em três categorias de análise: Atividade física para proteção cardiovascular; Atividade física na redução da Pressão Arterial Sistêmica; Atividade física no controle do colesterol, glicemia e Diabetes *Mellitus*. **Conclusão:** as pessoas com idade entre 20 e 59 anos devem praticar, no mínimo, 150 minutos de atividade física moderada ou vigorosa por semana; as pessoas idosas, pelo menos 20 minutos de atividade física moderada a vigorosa por dia, se indicado e de acordo com as condições físicas de cada pessoa.

DESCRITORES: Coração; Exercício físico; Saúde do adulto; Idoso.

ABSTRACT

[1,2,3,4,5] Universidade Federal de Santa Maria, Palmeira das Missões, Rio Grande do Sul, Brasil.

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CORRESPONDING AUTHOR: Silomar Ilha
E-mail: silomar.ilha@ufsm.br

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Objective: to identify the contributions of physical activity to the cardiovascular health of adults and elderly individuals. **Method:** to conduct a narrative review study, searching the databases of Latin American and Caribbean Literature in Health Sciences; the Database of Nursing and Medical Literature and Retrivial System Online, through the Virtual Health Library. A discursive textual analysis was performed. **Results:** a central category was generated, which was divided into three categories of analysis: Physical activity for cardiovascular protection; Physical activity to reduce systemic blood pressure; Physical activity to control cholesterol, blood glucose and diabetes mellitus. **Conclusion:** individuals aged 20 to 59 years should practice at least 150 minutes of moderate or vigorous physical activity per week; elderly individuals should practice at least 20 minutes of moderate to vigorous physical activity per day, if indicated and according to the physical condition of each individual.

DESCIRPTORS: Heart; Exercise; Adult health; Aged.

RESUMEN

Objetivo: identificar los aportes de la actividad física a la salud cardiovascular de adultos y ancianos. **Método:** estudio de revisión narrativa, búsqueda en bases de datos de Literatura Latinoamericana y del Caribe en Ciencias de la Salud; Se realizó análisis textual discursivo de la base de datos sobre literatura médica y de enfermería y el sistema de recuperación en línea. **Resultados:** generó una categoría central, dividida en tres categorías de análisis: Actividad física para protección cardiovascular; Actividad física para reducir la presión arterial sistémica; Actividad física en el control del colesterol, la glucemia y la Diabetes Mellitus. **Conclusión:** las personas de 20 a 59 años deben practicar al menos 150 minutos de actividad física moderada a vigorosa por semana; personas mayores, al menos 20 minutos de actividad física moderada a vigorosa al día, si está indicado y según las condiciones físicas de cada persona.

DESCRIPTORES: Corazón; Ejercicio físico; Salud del adulto; Anciano.

INTRODUCTION

The 2020 Demographic Census revealed that the number of people over the age of 65 has grown exponentially in Brazil.[1] As the population ages, it becomes more susceptible to chronic non-communicable diseases (NCDs), which are of the greatest magnitude in the country, especially affecting the most vulnerable populations with low incomes and education. Among the NCDs that affect adults and the elderly, cardiovascular diseases have the highest incidence worldwide, accounting for 31% of all deaths.[2]

The scenario is no different in Brazil. Cardiovascular health is an important point to note in the general population, given that of the 14,731,778 deaths that occurred in the country between 2011 and 2021, 3,881,229 were due to diseases of the cardiocirculatory system. This is equivalent to approximately 26% of the total deaths in the country over the 10-year period.[3] Cardiovascular diseases (CVD) tend to develop silently, without the manifestation of symptoms, altering the functioning of the heart and blood vessels, systems responsible for transporting oxygen and nutrients to all the organs and cells in the body.[4]

However, there are risk factors for developing heart disease, some of which are considered to be modifiable and others non-modifiable. Among the modifiable ones are: hyperlipidemia, smoking, alcoholism, hyperglycemia, obesity, sedentary lifestyle and poor diet. Non-modifiable factors include family history, age, gender and race. In this context, we highlight Systemic Arterial Hypertension (SAH)3 and lipid parameters, known as cholesterol and triglycerides, measured by High Density Lipoproteins (HDL); Low Density Lipoproteins (LDL) and Very Low Density Lipoproteins (VLDL). Alterations of this nature increase the risk of cardiovascular disease.[4]

It is therefore important to invest in expanding and deepening knowledge in this area, as well as in strategies that can contribute to improving the reality presented. It should be emphasized that the first approach to people with risk factors, sedentary, with hypertension or coronary disease, obese and/or with comorbidities, should be to encourage non-pharmacological measures, which can show positive results in a short or medium period of time.[5] It is in this context that the practice of regular activities (PA) or physical exercise (PE) helps, as it can improve health outcomes, reducing mortality, especially from the cardiac point of view.[6]

In this sense, PA refers to body movements carried out intentionally during leisure time, household chores or commuting to school or work, and can be recommended by any health professional. PE, on the other hand, is characterized by planned and structured PA, guided by a physical education professional, with the aim of improving or maintaining muscle structure, flexibility and balance.[7]

PA improves overall cardiovascular function and reduces the risk of new NCDs.[7] Thus, there is a need to understand the contribution of PA practice to the cardiovascular health of adults and the elderly, with a view to encouraging it among the population. It should be noted that research related to CNCDs is necessary and is considered a priority by the National Research Agenda in Brazil.[8] The aim of this study was therefore to identify the contributions of physical activity to the cardiovascular health of adults and the elderly.

METHOD

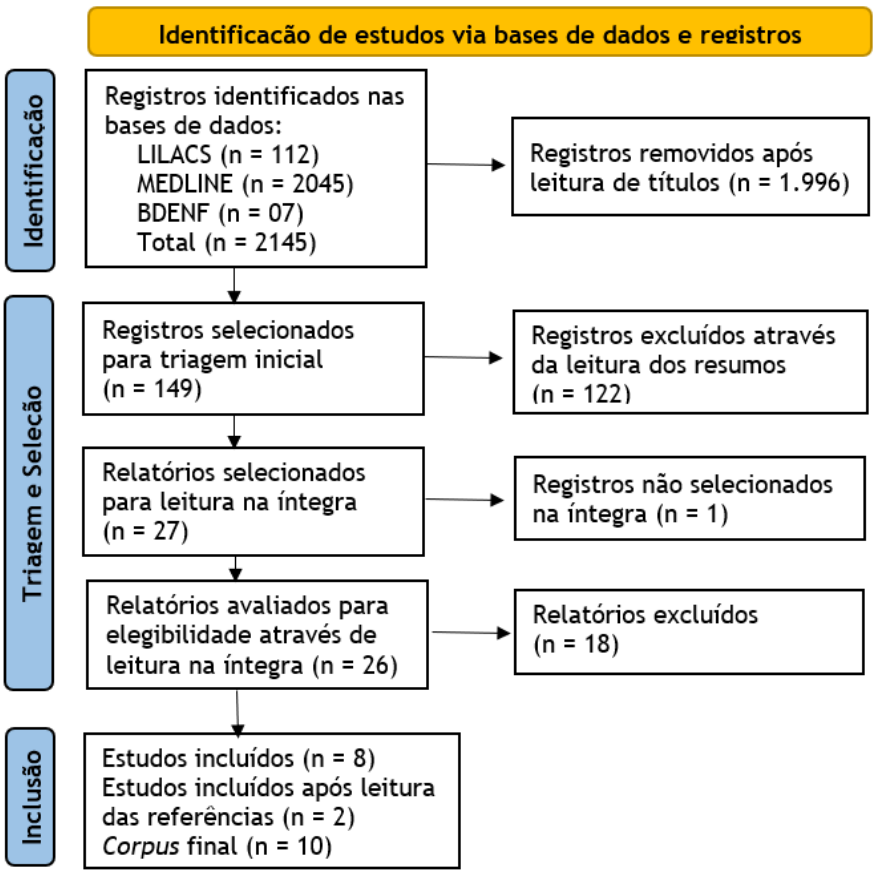
This is a Narrative Literature Review (NLR) study, which analyzes the literature in different media and does not need to indicate methodological characteristics.[9] However, it was decided to describe some information, in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.[10]

This review began with the question: "What are the contributions of physical activity to cardiovascular health in adults and the elderly?". To this end, a search was carried out in March 2024 in the databases Latin American and Caribbean Literature in Health Sciences (LILACS); Nursing Database (BDENF) and Medical Literature and Retrivial System Online (MEDLINE), via the Virtual Health Library (VHL), using the Health Sciences Descriptors (DeCS): "health", "heart" and "physical exercise", combined with the Boolean operators "AND" and "OR".

The inclusion criteria were: research articles in Portuguese, English or Spanish, published in the last five years (in order to provide more recent knowledge on the subject). Materials that did not allow free access and that did not deal with the subject were excluded.

The selection of studies was uni-independent (author 1), with titles and abstracts being read first. The materials were then read in full. Any doubts about the selection were resolved with the study's supervisor (last author). Initially, eight papers were considered. However, on reading their references, two other articles were included.[11-12] Based on this, the corpus of this narrative was made up of 10 articles (Figure 1).

Figure 1 - Flowchart for selecting studies from the LILACS, BDENF and MEDLINE databases.



Source: adapted.10

The materials were submitted to discursive textual analysis, organized into three components: 1) Unitarization: the researcher examined the texts in detail, in order to reach units of meaning; 2) the establishment of relationships between the units was sought, combining and classifying them, resulting in different levels of analysis categories; 3) Communication, where the researcher presented the understandings, resulting in the metatexts of description and interpretation.[13]

RESULTS

A total of 27 articles were selected, but it was not possible to access one article in its entirety, leaving 26 articles to be read, eight of which were synthesized. After reading the references of the eight selected articles, another two were considered, totaling 10 (100%) articles to make up the corpus of this review. The characteristics of the studies were extracted (Chart 1).

Chart 1 - Summary of the main characteristics of scientific publications on physical activity in cardiovascular health.

Autor/Ano	Objective	Country	Method
Ashton et al (2020)[11]	To examine the effects of short-, medium- and long-term resistance exercise training (RET) on measures of cardiometabolic health in adults.	United Kingdom	**Design:** Systematic systematic review. **Population:** 173 studies included. **Data collection technique:** MEDLINE Ovid database and Cochrane Library
Paluch et al (2024)[12]	Summarize the benefits of resistance exercise (RE) for improving traditional and non-traditional CVD risk factors.	North America	**Design:** Scientific statement. **Population:** not applicable. **Data collection technique:** Not applicable.
Zhang, Liu (2024)[14]	To explore the relationship between PA and sedentary behaviors and CVD in the risk of all-cause mortality.	China	**Design:** cohort study **Population:** 13,699. **Data collection technique:** National Health and Nutrition Examination Surveys (NHANES) database.
Lai et al (2024)[15]	To investigate the interactive effects of PA and sarcopenia in Ischemic Heart Disease.	China	**Design:** Cohort study **Population:** 344,688. **Data collection technique:** UK Biobank database with questionnaire.
Cheon et al (2024)[16]	To investigate the effects of changes in PA on the risk of AMI after ischemic stroke, using data from the National Health Insurance Service database. Insurance Service database	Korea	**Design:** Cohort study. **Population:** 224,764 patients newly diagnosed with ischemic stroke. **Data collection technique:** Korea National Health Insurance Service (K-NHIS) database.
Lönn et al (2023)[17]	To explore the extent to which PA levels or changes in PA levels during the first year post-MI were associated with any recurrent non-fatal CVD events and specific CVD events.	Sweden	**Design:** Cohort study. **Population:** 80,160. **Data collection technique:** Swedish national registers between 2005 and 2020.
Panahian et al (2023)[18]	To assess the association of walking or moderate to vigorous PA of various durations with cardiovascular risk in age and sex groups of the general adult population.	Brazil	**Design:** Cohort study. **Population:** 1,720. **Data collection technique:** Patients were randomly and systematically selected in an urban area and were interviewed and subjected to measurement of clinical and anthropometric variables at home.

Autor/Ano	Objective	Country	Method
Barbiellini et al (2022)[19]	Associating PA trajectories with the main CVDs in the elderly.	Italy	**Design:** Cohort study. **Population:** 3,099. **Data collection technique:** follow-up visits to patients with CD and stroke, through clinical examination, questionnaire or hospital records.
Momma et al (2022)[20]	To quantify the associations between muscle strengthening activities and the risk of non-communicable diseases and mortality in adults independent of aerobic activities.	United Kingdom	**Design:** Systematic review. **Population:** 16 studies included. **Data collection technique:** MEDLINE and Embase databases.
Herrod; Lund; Phillips (2021)[21]	To compare the effect of three new time-efficient PA interventions on resting BP in older adults.	United Kingdom	**Design:** Randomized clinical trial. Population: 48. **Data collection technique:** Randomized recruitment of residents from the local population.

Source: prepared by the authors. 2024.

Analysis of the materials led to the construction of a central category and three categories of analysis, as shown in Table 2

Table 2 - Interconnection of the central category, analysis categories and summary of results.

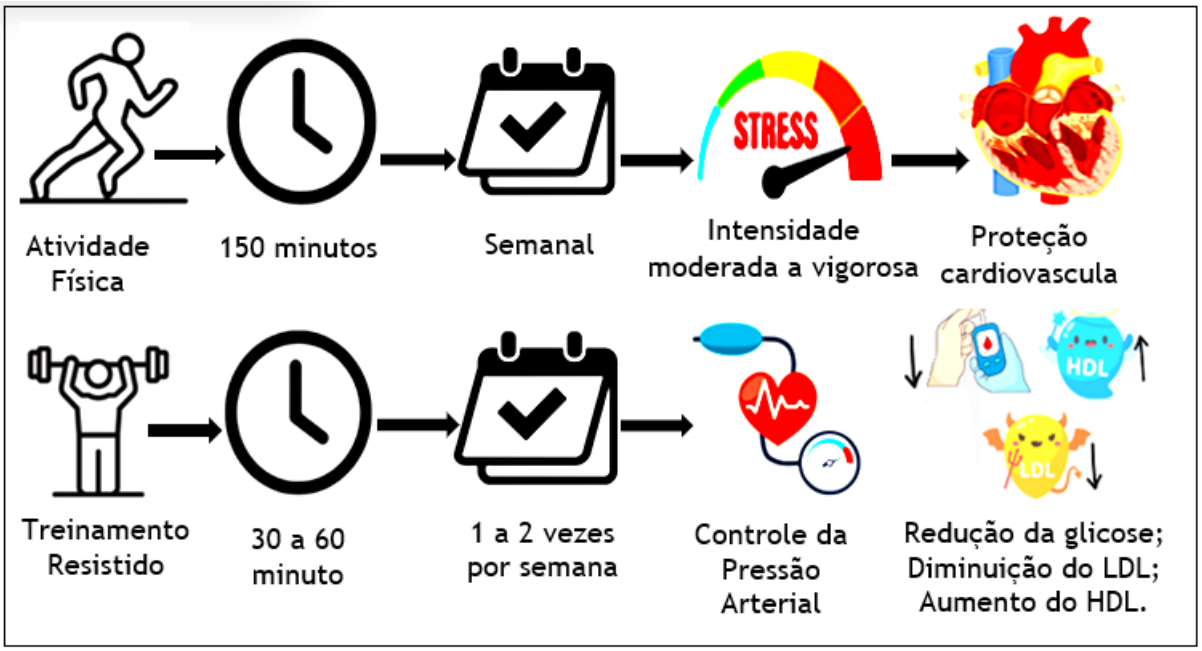
Contributions of physical activity to the reduction of cardiovascular diseases in adults and the elderly	
Physical activity for cardiovascular protection. [12,14-17,19-20]	Resistance training programs (exercise involving muscle contraction against an external force) have been shown to reduce the risk of CVD when performed for 30 to 60 minutes a week. A single set of 8 to 12 repetitions until voluntary fatigue, using moderate loads of 40 to 60% for 8 to 10 different exercises involving large muscle groups, performed twice a week, is already favorable.[12] Middle-aged people who are overweight (BMI>30) should take more care of their health, especially those aged ≥65 years. High sedentary time, as well as low PA, can increase the risk of developing CVD and all-cause mortality.[14] People who practiced moderate PA had a similar risk of ischemic heart disease compared to those who practiced advanced PA. People who performed low levels of PA had a significantly higher risk of heart disease. PA can help reduce the risk of ischemic heart disease, especially in adults and the elderly.[15] Any level of physical activity after stroke was associated with a reduced risk of AMI compared to no exercise. Starting or maintaining physical activity after a stroke reduces the risk of AMI.[16] Remaining physically active or changing physical activity levels during the first year after AMI was associated with a lower risk of non-fatal cardiovascular events.[17] In people aged ≥65 years, PA was associated with a reduced risk of coronary heart disease and heart failure, especially early in life. 20 minutes of moderate to vigorous PA per day is recommended to achieve the greatest cardiovascular benefits.[19] The practice of moderate or vigorous PA in people aged between 20 and 59 for ≥150 minutes per week has shown a significant cardioprotective role in older people.[20]
Physical activity in reducing systemic blood pressure (SBP).[12,21]	Twice-weekly RT provided improvements in the endothelial function of blood vessels and greater vasodilator capacity, lowering SBP, especially in adults over 40. There was a 3 mmHg reduction in systolic and diastolic BP in adults with pre-hypertension. There was a reduction of 6 mmHg in systolic BP and 5 mmHg in diastolic BP in hypertensive people.[12] Elderly people who performed High Intensity Interval Training (HIIT) or isometric handgrip training (IHG) for 6 weeks obtained a reduction of up to 9 mmHg in mean arterial pressure (MAP) at rest.[21]

Contributions of physical activity to the reduction of cardiovascular diseases in adults and the elderly	
Physical activity in the control of cholesterol, glycemia and Diabetes Mellitus (DM).[11,20]	RT in adults resulted in improvements in HDL cholesterol (increase of 2 to 12 mg/dl); a reduction of 8 mg/dl in total cholesterol and 7 to 12 mg/dl in triglycerides.[11] Regular participation in RT by adults is associated with a 17% reduction in the incidence of DM compared to no participation in PA. 60 minutes of RT per week can have this beneficial effect, as well as reducing fasting glycemia by 2 to 5 mg/dl among older adults and a 0.34% decline in glycated hemoglobin after training.[20]

Source: prepared by the authors. 2024

Figure 2 shows an illustration of the benefits of PA for the cardiovascular health of adults and the elderly.

Figure 2 - Illustrative summary of the indications for better cardiovascular health.



Source: prepared by the authors. 2024.

DISCUSSION

The materials showed that the practice of PA in adults and the elderly contributes to cardiovascular protection[12,14-17,19-20], which is in line with the PA guide for the Brazilian population.[22] This material reveals benefits that can be achieved through the practice of PE, such as well-being, reduced tiredness, blood pressure control, improved sleep and cardiovascular quality. One of the material's highlights is the guidance that performing any PA at the time and place you can is better than not doing it at all.[22]

It is important to note that PA can be divided into three levels: light, moderate and intense, which vary on a scale from zero to 10 (zero = no perception and 10 = perception of intense effort). The light level is characterized by minimal effort, with perception ranging from 1 to 4. The moderate level requires more effort, increasing the intensity of breathing and the perception of effort is between 5 and 6. In the intense level, there is a marked acceleration in breathing and heart rate and the perception of effort is between 7 and 8. The amount of PA should be equal to or greater than 150 minutes a week if the effort is moderate and at least 75 minutes a week if it is intense.[22]

An experimental study of 11 elderly women in pre-established training protocols aimed at hypertrophy concluded that RT reduced serum concentrations of C-Reactive Protein and decreased fat mass. It also increased muscle volume and strength, making it an efficient strategy for reducing risk factors for CVDs.[23]

Thus, although the WHO recommends at least 150 minutes of moderate to intense PA per week, any kind of effort to perform it, even if it is less than recommended, will bring some health benefits.[7] It is therefore understood that performing any PA is better than a sedentary lifestyle, since it is fundamental for the prevention and primary treatment of NCDs, as well as contributing to reducing the risk of death from these causes.

Another contribution of PA is the reduction of hypertension.[12,21] A similar finding was made in a systematic review that aimed to examine the impact of PA on mortality in patients with hypertension. It showed that the reduction in resting systolic BP was similar when strength training was compared to the use of antihypertensive drugs. Thus, PA reduced the risk of cardiovascular and/or all-cause mortality in at least 16% of participants.[23]

Another relevant finding concerns the contribution of different types of physical exercise (HIIT, IHG and RIPC) in reducing SBP.[21] This finding is in line with those found in other studies.[24-25] A systematic review with meta-analysis, with a pooled sample of 15,827 participants, concluded that the effects of HIIT in reducing SBP at rest reached up to -4.0mmHg. With regard to IHG, there was a reduction of -8.0 mmHg.[25] Research carried out in Chile found that IHG performed twice a week for eight weeks reduced systolic BP from 140 to 130 mmHg, a reduction of 10 mmHg in hypertensive individuals.[26]

HIIT is characterized as a type of high-intensity training that intersperses an intermittent period and a period of exercise. In the exercise period, high-intensity physical training is carried out over a short period of time, while in the intermittent period, calming or resting actions are carried out.[27] IHG is a type of isometric training that consists of using a device called a dynamometer to apply force to it, thus making a continuous and controlled muscle contraction.[28] RIPC refers to short sequences of ischemia, usually 4 to 5 minutes, of repeated inflations and deflations of the sphygmomanometer cuff on one of the upper limbs. It is an effective technique for protecting the heart against ischemia and reperfusion injuries, since short periods of ischemia trigger cell signaling pathways that protect against a subsequent longer period of ischemia.[29]

Corroborating this, a meta-analysis that explored various types of PE and their effects on 5,223 participants showed that all types of PE were able to lower systolic and diastolic BP. The effects were significantly greater in hypertensive individuals who had resistance exercise as a form of intervention (a decrease of 8.3 mmHg in SBP and 5.2 mmHg in DBP) than pre-hypertensive individuals (a decrease of 2.1 mmHg in SBP and 1.1 mmHg in DBP).[30]

In this sense, PA is an important factor in overall health, especially cardiovascular health, since diseases of the circulatory system are the leading cause of death in Brazil (109,556 deaths in 2020 due to AMI), and the practice of PA can reduce deaths from AMI by up to 80%.3 It also shows a contribution in terms of lowering cholesterol, blood glucose and DM levels.[11,20]

An observational study showed that physical training significantly reduces blood cholesterol, HDL and LDL levels. Although drug therapy is essential, lifestyle changes for people with high levels of cholesterol and triglycerides in the blood are essential.[31] A study of men with type II DM who underwent HIIT training for two weeks showed a reduction in blood glucose in the afternoon. With this, the results showed that exercise in the form of HIIT is a possible means of controlling blood glucose and reducing the deleterious effects of type II DM.[31] In this sense, exercise is fundamental for health and should always be promoted and encouraged for the general population.[32]

These data are relevant, since cholesterol is a type of lipid produced by the liver, differentiated between LDL and HDL, and can be of high or low density. Excess LDL can be the precursor to various diseases, as its high concentration in the body generates fatty deposits on artery walls, forming atherosclerotic plaques that increase the risk of obstruction. HDL, on the other hand, causes excess cholesterol in the cells/bloodstream to be eliminated or stored in adipose tissue, instead of being deposited in the bloodstream.[8]

In this sense, high levels of LDL may be related to cardiovascular disease, complications in the aorta, as well as dementia and strokes. High levels of HDL cholesterol, on the other hand, can be attributed to some degree of protection against these diseases. In order to strike a balance, it is recommended to practice PA and eat a healthy, balanced diet. It's important to note that up to 20% of cholesterol comes from food and in some cases medication is needed to control it.[8] In the case of DM, excess sugar in the blood can lead to blood clots and circulatory difficulties, resulting in an increase in cardiovascular diseases.

FINAL CONSIDERATIONS

This narrative made it possible to identify the contributions of physical activity to the cardiovascular health of adults and the elderly. The main contributions were: cardiovascular protection; reduction of hypertension; control of cholesterol, glycemia and diabetes mellitus. In short, it was found that practicing moderate or vigorous physical activity contributes to reducing the risk of developing IHD; to a lower risk of non-fatal cardiovascular events; and that any level of PA after exercise contributes to reducing the risk of AMI compared to no exercise.

It is worth mentioning that the inability to generalize the data, as well as the lack of a broad mapping of descriptors, synonyms and mesh terms, may have been limitations of this study. It is therefore recommended that further research on the subject be carried out with different audiences, with a view to broadening and deepening knowledge, as well as encouraging the population to practice regular PA.

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