REVIEW ARTICLE

REVISTA ENFERMAGEM ATUAL IN DERME

THE EFFECTIVENESS OF MEDICINAL PLANTS IN THE TREATMENT OF CHRONIC NON-COMMUNICABLE DISEASES

A EFICÁCIA DE PLANTAS MEDICINAIS NO TRATAMENTO DE DOENÇAS CRÔNICAS NÃO TRANSMISSÍVEIS

A EFICÁCIA DE PLANTAS MEDICINAIS NO TRATAMENTO DE DOENÇAS CRÔNICAS NÃO TRANSMISSÍVEIS

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ABSTRACT
Introduction: medicinal plants are used in primary health care, standing out as one of people's first resources in treating their health problems. **Objective:** to understand the benefits of using medicinal plants to control chronic non-communicable diseases. **Method:** This is a bibliographical research of the integrative literature review type. This procedure was chosen to enable the synthesis and analysis of scientific knowledge already produced on the topic, with the guiding question being: What scientific evidence cites the way in which medicinal plants are used in the treatment of chronic diseases by the community in primary care. **Results:** In total, 12 studies were included, considered eligible to compose the evidence synthesis, in which it was highlighted that there is a large collection of medicinal plants, still little explored, but which have been explored over the years, being included as alternative therapies and complementary treatments that can be used in the treatment of multiple chronic diseases, with different forms and uses, they also have a low level of toxicity and are considered to have potential efficacy and safety. **Final Considerations:** it is emphasized that the use of medicinal plants must be carried out under professional health guidance and that more studies are still needed to emphasize the dosage, safety and real effects of medicinal plants in the treatment of chronic non-communicable diseases.
Keywords: Plants, Medicinal; Chronic Disease; Therapeutics.

RESUMEN
Introducción: las plantas medicinales son utilizadas en la atención primaria de salud, destacándose como uno de los primeros recursos de las personas en el tratamiento de sus problemas de salud. **Objetivo:** comprender los beneficios del uso de plantas medicinales para el control de enfermedades crónicas no transmisibles. **Método:** Se trata de una investigación bibliográfica del tipo revisión integrativa de la literatura. Este procedimiento fue elegido para posibilitar la síntesis y análisis del conocimiento científico ya producido sobre el tema, siendo la pregunta orientadora: ¿Qué evidencia científica cita la forma en que las plantas medicinales son utilizadas en el tratamiento de enfermedades crónicas por la comunidad en la atención primaria? **Resultados:** En total se incluyeron 12 estudios, considerados elegibles para componer la síntesis de evidencia, en los que se destacó que existe una gran colección de plantas medicinales, aún poco exploradas, pero que han sido exploradas a lo largo de los años, incluyéndose como alternativas. Terapias y tratamientos complementarios que pueden utilizarse en el tratamiento de múltiples enfermedades crónicas, con diferentes formas y usos, además tienen un bajo nivel de toxicidad y se considera que tienen potencial de eficacia y seguridad. **Consideraciones finales:** se enfatiza que el uso de plantas medicinales debe realizarse bajo orientación profesional de la salud y que aún se necesitan más estudios para enfatizar la dosis, seguridad y efectos reales de las plantas medicinales en el tratamiento de enfermedades crónicas no transmisibles.
Palabras clave: Plantas Medicinales; Enfermedad Crónica; Terapéutica.

RESUMO
Introdução: as plantas medicinais são usadas na atenção primária à saúde, se destacando como um dos primeiros recursos das pessoas na terapia de seus problemas de saúde. Objetivo: conhecer os benefícios do uso das plantas medicinais no controle das doenças crônicas não transmissíveis. **Método:** Trata-se de uma pesquisa do tipo revisão integrativa da literatura. Este procedimento foi escolhido por possibilitar a síntese e análise do conhecimento científico já produzido sobre o tema, tendo como questão norteadora: Que evidências científicas citam a forma como as plantas medicinais são utilizadas no tratamento de doenças crônicas pela comunidade na atenção primaria. **Resultados:** Ao todo foram incluídos 12 estudos considerados elegíveis para compor a síntese de evidências, na qual destacou-se que existe um grande acervo de plantas medicinais, ainda pouco explorado, mas que vem sendo desbravadas ao longo dos anos, sendo incluídas como terapias alternativas e complementares podendo ser usadas no tratamento de múltiplas doenças crônicas, com diferentes formas e usos, apresentam também um baixo teor de toxicidade sendo consideradas com potencial eficácia e segurança. **Considerações Finais:** ressalta-se que o uso de plantas medicinais deve ser feito sobre orientação profissional da saúde e que ainda são necessários mais estudos que enfatizem sobre dosagem, segurança e reais efeitos das plantas medicinais no tratamento de doenças crônicas não transmissíveis.
Palavras-chaves: Plantas Medicinais; Doenças Crônicas; Terapêutica.

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INTRODUCTION

Communities' understanding of the environment, specifically plants, dates back centuries. Ancient peoples observed that there were plants that, when tested to combat diseases, demonstrated great healing potential. Information about these plants, people and culture, related to their experimental use and biological effects, is analyzed, evaluated and studied by areas known as ethnobotany and ethnopharmacology[1].

Medicinal plants in the North and Northeast regions represent one of the main sources of treatment for diseases for a large part of traditional populations due to cultural influences and the high cost of therapeutic and pharmaceutical products. Many poor people in urban areas and especially in rural areas have medicinal plants as the only available means of treatment for primary diseases[2].

It is important to emphasize that medicinal plants are used in primary health care, standing out as one of the first resources for people to treat their health problems. They are excellent options due to their low cost and dissemination of popular knowledge. As this knowledge is stimulated, it is adapted to the standards and the adequate promotion of its use by health units, it creates a connection between scientific knowledge and popular knowledge[3].

Currently, chronic non-communicable diseases (NCDs) are the main cause of morbidity, disability, preventable diseases and premature death in several regions of the world. In recent decades, they have shown a marked trend of increasing incidence and mortality rates, sharing risk factors and comorbidities in millions of people in different latitudes globally[4].

In addition to expanding treatment options with a positive concept of health, medicinal plants also promote friendly relationships between professionals and the community. However, its current implementation as a care strategy faces many challenges, but the actions are being carried out gradually and should be disseminated so that similar recommendations can be implemented[5].

The main problem of this study was: “What evidence shows the effectiveness of medicinal plants in the treatment of chronic non-communicable diseases?” To this end, the aim was to understand the benefits of using medicinal plants in the control of chronic non-communicable diseases.

In view of this, the choice of the theme was based on the interest in investigating the therapeutic effects that medicinal plants have in the treatment of chronic diseases, being of utmost importance to encourage the performance of scientific studies that legitimize popular knowledge about plants and their effectiveness in combating some diseases, since the population uses medicinal plants without due proof of effectiveness and adequate dosage.

Thus, this work is relevant to the scientific community since it seeks to provide information on alternative therapies for the treatment of chronic non-communicable diseases, highlighting the main plants used, in

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addition to being relevant to society, providing reliable information on the use of medicinal plants. Thus, it is expected that this study will contribute to a greater dissemination of information about medicinal plants within the treatment of chronic non-communicable diseases to expand knowledge and prove benefits.

METHODS

This is an Integrative Review (IR) study, descriptive, exploratory, and qualitative. This type of study has been identified as a unique tool in the health field, as it assesses current research knowledge on a topic and provides new insights into it[6].

Based on the general theme "THE USE OF MEDICINAL PLANTS IN THE TREATMENT OF CHRONIC NON-COMMUNICABLE DISEASES: an integrative review", the guiding question was determined as follows: What evidence shows the effectiveness of medicinal plants in the treatment of chronic non-communicable diseases?

The databases used for data collection were PubMed from the National Library of Medicine; Cumulative Index to Nursing and Allied Health Literature (CINAHL) from EBSCO; and the Virtual Health Library (BVS), coordinated by the Regional Library of Medicine (BIREME) and composed of bibliographic databases produced by the BVS Network, such as LILACS, in addition to the Medline database and other types of information sources.

The inclusion criteria used were complete studies published between 2018 and 2022, in Portuguese, English and Spanish. Book chapters, abstracts, theses, dissertations, monographs, technical reports, review studies and other forms of publication other than complete scientific articles (such as reports, guides, letters to the editor, among others) were excluded from the initial search.

The research question determined the construction of the PICO strategy, which represents an acronym for Patient or Problem (P), Intervention (I), Comparison (C) and Outcomes (O-outcomes). At this stage, descriptors and "alternative terms" linked to the Science and Health Descriptors (DECs) and Medical Subject Headings (Mesh terms) and keywords were used, as shown in Table 1.

Table 1 - Descriptors according to elements of the PICO strategy. Caxias, MA, Brazil, 2022.

	Elements	**Decs**	**Mesh**	**Titles of CINAHL**	**Alternative terms or Keywords**

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P	Doenças crônicas	*"Non-Communicable Diseases"* *"Non-Communicable Diseases"* *"Non-Communicable Diseases"* *"Chronic Disease"* *"Chronic Disease"* *"Disease"* *"Disease"*	*"Noncommunicable Diseases"* *"Chronic Disease"* *"Disease"*	*"Chronic Disease"*	*"Non-communicable Chronic Diseases"* *"Noncommunicable Diseases"*
I	Medicinal plants	*"Plants Medicinal"* *"Plants, Medicinal"* *"Plants Medicinales"* *"Plants"* *"Plants"* *"Plants"*	*"Plants, Medicinal"* *"Plants"*	*"Plants, Medicinal"* *"Plants"*	*"Herb, Medicinal"* *"Pharmaceutical Plants"* *"Healing Plants"*
C	-	-	-	-	-
O	Clinical efficacy	*"Effectiveness"* *"Effectiveness"* *"Effectiveness"* *"Efficacy"* *"Effectiveness"*	*"Therapeutics"*	*"Therapeutics"*	*"Therapeutics"*

Source: Science and Health Descriptors, CINAHL Titles and Medical Subject Headings, 2022.

The Boolean expression used between terms of the same element was "OR" and between elements of the strategy it was the Boolean expression "AND", which resulted in the search address as shown in Table 2. The term "C" was not used, as this study does not aim to compare interventions.

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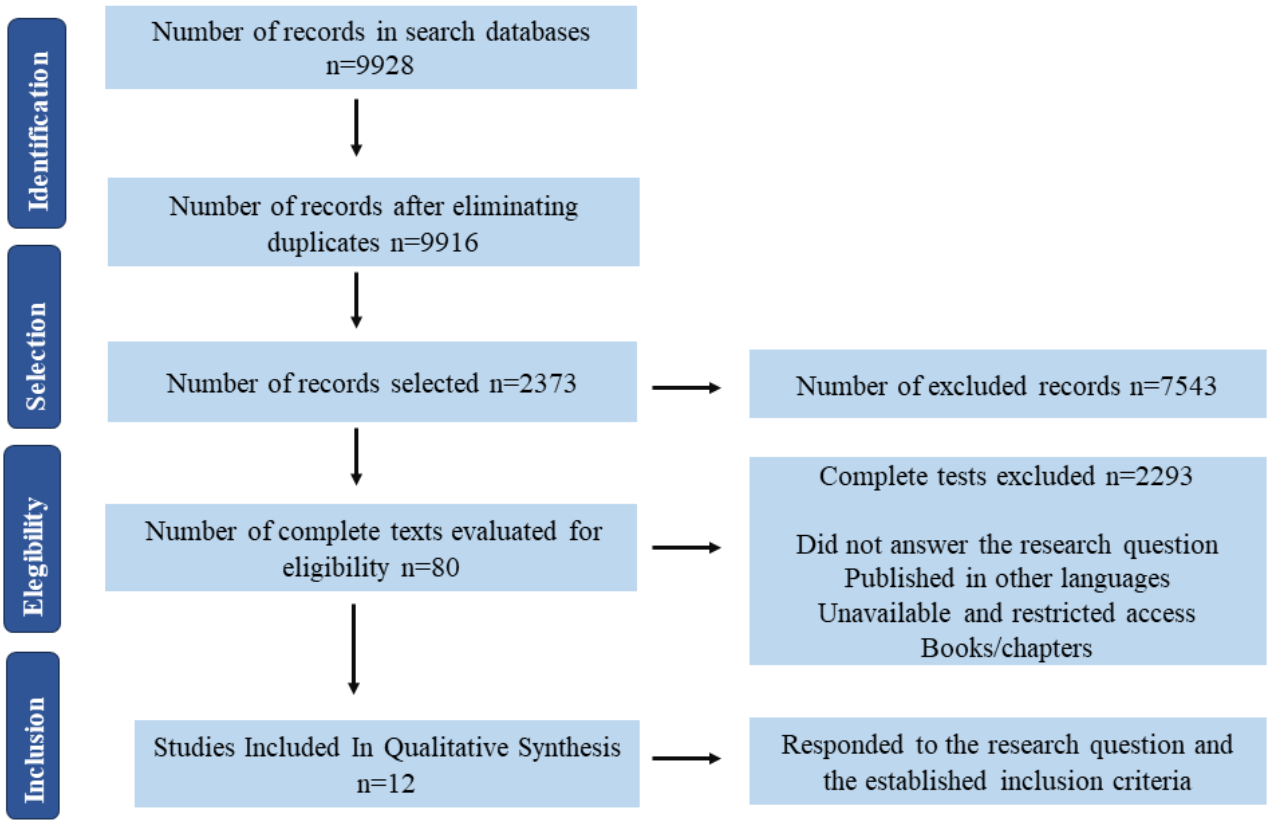
Table 2 - Search address in database. Caxias, MA, Brazil, 2022.

Databasse	Search strategy	Results	Screening	Selected
BIREME	("Doenças não Transmissíveis") OR ("Noncommunicable Diseases") OR ("Enfermedades no Transmisibles") OR ("Doença Crônica") OR ("Chronic Disease") OR ("Enfermedad Crónica") OR ("Noncommunicable Chronic Diseases") OR (Doença) OR (Disease) OR (Enfermedad) AND ("Plantas Medicinais") OR ("Plants, Medicinal") OR ("Plantas Medicinales") OR (Plantas) OR (Plants) OR (Plantas) OR ("Herb, Medicinal") OR ("Pharmaceutical Plants") OR ("Healing Plants") AND (Efetividade) OR (Effectiveness) OR (Efectividad) OR (Eficácia) OR (Efficacy) OR (Eficacia) OR (Therapeutics)	5.855	830	2
PUBMED	(Noncommunicable Diseases) OR (Chronic Disease) OR (Non-communicable Chronic Diseases) AND (Plants, Medicinal) AND (Therapeutics)	858	159	7
CINAHL	(Noncommunicable Diseases) OR (Chronic Disease) AND (Plants, Medicinal) AND (Therapeutics)	3,215	1384	3

Source: Database, 2022.

Figure 1 shows the flowchart of the article selection process in the consulted databases. In the end, twelve (12) articles met the guiding question and were added to the summary of results.

Figure 1 - Flowchart of the study selection process. Caxias, MA, Brazil, 2022.



Source: Database, 2022.

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In the data analysis stage, information from scientific articles was extracted and analytical categories were created to facilitate the organization and summary of each study. This categorization was performed descriptively, indicating the most relevant data for the study.

We opted for statistical and text analysis, using mathematical calculations and inferences, which are presented in tables and charts to facilitate visualization and understanding. Scientific evidence and degrees of recommendation were classified according to guidelines[7].

RESULTS

The presentation of the results was organized into two parts. The first was related to the characterization of the studies, while the second was related to the fulfillment of the study objective, which concerns the analysis of the scientific production on the benefits of the use of medicinal plants in the control of chronic non-communicable diseases, therapeutic action of the plants, form of consumption, prolonged effects of the use of medicinal plants, safety and side effects associated with the use of medicinal plants in the treatment of chronic non-communicable diseases.

Table 1 shows the characterization of the studies analyzed. Based on the results, the PUBMED database presented the largest amount of evidence (58.3%), in which the journal Evidence-Based Complementary and Alternative Medicine presented the largest number of publications (16.7%). Regarding the approach, all of them carried out a quantitative approach to the data (100%), in which Iran was the country that presented the largest number of publications (25.0%).

Regarding the year of publication, 2021 and 2022 presented the highest number of studies analyzed, 33.3% and 25.0%, respectively; where all studies were in English (100%). Regarding the research design, level of evidence and degree of recommendation, there was a prevalence of Randomized clinical trials (83.3%) and level of evidence two (83.3%), in which 83.3% of the studies recommended the intervention.

Table 1 - Characterization of the studies analyzed on the effects of medicinal plants on chronic non-communicable diseases. Caxias, MA, Brazil, 2022.

Variables	N	%
Database		
BIREME	2	16,7
PUBMED	7	58,3
CINAHL	3	25,0
Study approach		
Quantitative	12	100,0
Year		
2018	1	8,3
2019	2	16,7
2020	2	16,7
2021	4	33,3
2022	3	25,0

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Language		
English	12	100,0
Country		
Iran	3	25,0
Thailand	1	8,3
China	1	8,3
India	1	8,3
Israel	1	8,3
Ethiopia	1	8,3
South Korea	1	8,3
Lebanon	1	8,3
Nigeria	1	8,3
Brazil	1	8,3
Research design		
Randomized clinical trial	10	83,3
Systematic review with meta-analysis	2	16,7
Recommendation grade		
A	10	83,3
B	2	16,7

Source: Own authorship, 2022.

The studies were also characterized according to the database, author, year, sample profile and main results, in order to facilitate the analysis and interpretation of the studies considered eligible for evidence synthesis (Table 3).

Table 3 - Publications included according to the database, author and year, sample profile and main results. Caxias, MA, Brazil, 2022.

Database	Author and year	Sample profile	Main results
A1 BIREME	Zojaji et al[8]	Of the 60 randomized participants, 46 completed the study (16 control and 30 treatment) and were included in the analysis. Participants were included in the study if they had grade ≥2 NAFLD on ultrasound or grade 1 NAFLD + elevated alanine transaminase (ALT) level (>40 U/L).	Thirty patients in the treatment group and sixteen patients in the control group completed the study. The herbal compound significantly decreased the serum level of alanine transaminase (ALT), aspartate transaminase (AST), and total cholesterol. Treatment with the herbal compound significantly improved the grade of fatty liver. The formulated herbal compound appeared to be effective in improving the biochemistry and decreasing the grade of fatty liver in NAFLD patients.
A2 BIREME	Tungsukruthai et al[9]	64 individuals, divided equally into two groups.	Symptoms of anterior or posterior rhinorrhea, including sneezing, nasal itching, and nasal congestion, were statistically significantly reduced over the course of treatment, but the reductions were not significantly different between the control and treatment groups. The treatment group, however, was significantly more satisfied with the treatment than the control group.
A3 CINAHL	Zhang e Qin[10]	60 patients with coronary heart disease and diabetes mellitus (the control group consisted of 18 men and 12 women; the observation group consisted of 19 male cases and 11	After treatment, the left ventricular end-diastolic pressure and left ventricular function of the two groups decreased ($p < 0.05$), while the left ventricular function increased ($p < 0.05$), with lower left

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		female cases).	ventricular end-diastolic pressure and left ventricular function and higher left ventricular function in the observation group than in the control group ($p < 0.05$).
A4 CINAHL	Swathi, Shetty e Shetty[11]	60 patients with chronic gastritis were randomly divided into two groups.	Significant decreases in gastrointestinal symptoms were observed in the experimental group verified by the gastrointestinal symptoms questionnaire ($p < 0.0001$), compared to the control group ($p = 0.2879$).
A5 CINAHL	Mohammadi–Araghi et al[12]	42 COPD patients were examined in two groups.	There is preliminary evidence of the efficacy and safety of Squill-Oxymel as add-on therapy in individuals with mild COPD.
A6 PUBMED	Meir et al[13]	294 participants with obesity/abdominal dyslipidemia.	Participants had an 89.8% 18-month retention rate and 78% had eligible follow-up proton MRI.
A7 PUBMED	Geberemeskel, Debebe e Nguse[14]	114 newly diagnosed type II diabetic patients without any significant diabetes complications.	Administration of Trigonella foenum-graecum seed powder solution had pronounced effects on improving lipid metabolism in type II diabetic patients without adverse effects.
A8 PUBMED	Sung et al[15]	50 patients with chronic fatigue.	The visual analog scale for fatigue decreased significantly in each group, but there were no significant differences between the groups. The 2 groups also had no significant differences in secondary outcome measures, and there were no adverse events.
A9 PUBMED	Samaha et al[16]	29 individuals with mild hypertension distributed into four groups.	Extracts from these plants show effective, safe and promising potential as a phytotherapeutic approach for the treatment of mild hypertension.
A10 PUBMED	Abdulazeez et al[17]	19 studies consisting of 16 preclinical studies and 3 clinical studies were enrolled for the meta-analysis.	A total number of 16 plants were identified, of which H. sabdariffa was the most reported plant. The plant extracts significantly reduced systolic blood pressure (SBP) and diastolic blood pressure (DBP) of hypertensive subjects compared to control.
A11 PUBMED	Carvalho et al[18]	Eighteen randomized controlled trials (RCTs) were included in this systematic review, and 12 studies were selected for meta-analysis. Based on the Cochrane Collaboration's risk of bias tool, all studies were of good quality.	Blueberry intervention had a significant effect on lipid levels, decreasing total cholesterol and low-density lipoprotein.
A12 PUBMED	Mehrzadi et al[19]	A total of 150 type II diabetic patients of both sexes under treatment with oral antihyperglycemic agents.	Traditional herbal combination can safely improve glycemic control in type II diabetic patients without significant adverse effect.

Source: Own authorship, 2022.

Evidence analysis

Regarding the articles contained in this review, most reported evidence that presented the benefits of using medicinal plants to assist in the treatment of chronic non-communicable diseases. It was observed that many plants have the potential to act together with the treatment of

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several pathologies, and that they do not present serious side effects. In this sense, it is worth noting that the popular names of the plants and their therapeutic action were highlighted to facilitate the understanding of the theme and main results. The discussion was divided into topics, in order to synthesize the most relevant information, where the 12 articles of the advanced search were used to discuss the theme.

Benefits of using medicinal plants in NCDs

It is worth noting that the 12 articles found in the advanced search highlighted the benefits of using plants to treat chronic non-communicable diseases. There are a multitude of medicinal plants used to treat various pathologies, such as Anethum graveolens, Citrus aurantium, Cynara scolymus, Portulaca oleracea, Silybum marianum and the green Mediterranean diet, which can have a positive effect on liver disease, fatty liver and reduce serum levels of liver enzymes and total cholesterol(8,13). Other diseases that can have symptoms reduced with the use of plants are: chronic obstructive pulmonary disease and type II diabetes[12,19].

Other benefits of using medicinal plants include: significant reductions in the symptoms of allergic rhinitis, antidyslipidemic effects in patients with type II diabetes, and reduction in systolic, diastolic and mean arterial pressure[9,14,16]. Table 4 presents the therapeutic actions of plants and their main benefits.

Table 4 - Therapeutic actions of plants and their main benefits. Caxias, MA, Brazil, 2022.

Author and year	Medicinal plant or phytotherapeutic studied	Therapeutic action
Zojaji et al[8]	*Anethum graveolens* (Endro) *Citrus aurantium* (Laranja-da-Terra) *Cynara scolymus* (alcachofra) *Portulaca oleracea* (beldroega) Silybum marianum (cardo mariano ou leiteiro)	Improvement in the degree of fatty liver and reduction in serum levels of liver enzymes and total cholesterol.
Tungsukruthai et al[9]	*Zingiber cassumunar* (gengibre cassumunar) *Curcuma longa* (açafrão da terra) Kaempferia galanga L. (Cananga-do-Japão) Acorus calamus L. (cana cheirosa) *Tamarindus indica* (tamarindo) *Cinnamomum camphora* (L.) Presl. (canforeira) *Dryobalanops aromática Gaertn* (cânfora-do-bornéu)	Improvement in symptoms of allergic rhinitis, such as runny nose, sneezing, itchy nose, nasal congestion and watery eyes.
Zhang e Qin[10]	*Ixeris sonchifolia Hance*	Control of left ventricular end-diastolic pressure, left ventricular end-systolic volume and left ventricular function.
Swathi, Shetty e Shetty[11]	*Garcinia Indica* (Kokum)	Relief of symptoms of chronic gastritis.
Mohammadi-Araghi et al[12]	*Drimia maritima* (cila)	Bronchodilatory capacity.
Meir et al[13]	*Wolffia globosa* (lentilha-d'água)	Reduction of intrahepatic fat.

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Geberemeskel, Debebe e Nguse[14]	*Trigonella foenum-graecum* (feno grego)	Decrease in total cholesterol, triglycerides and LDLC levels.
Sung et al[15]	Red Korean Ginseng	Reduction in symptoms of moderate fatigue in middle-aged individuals.
Samaha et al[16]	*Mentha longifólia* (menta silvestre) Viola odorata Urtica dioica *Allium ampeloprasum* (Alhoporro-bravo) *Apium graveolens* (salsão) *Crataegus azarolus*	Reduction in systolic, diastolic and mean arterial pressure.
Abdulazeez et al[17]	*H. sabdariffa* (Caruru-azedo)	Blood pressure control.
Carvalho et al[18]	Blueberry	Decrease in total cholesterol and low-density lipoprotein.
Mehrzadi et al[19]	*Capparis spinosa* (alcaparra) *Securidaca securigera* Roa canina Urtica dioica *Silybum marianum* (cardo de leite) *Vaccinium arctostaphylos* (mirtilo caucasiano) *Trigonella foenum-graecum* (feno grego)	Decreased fasting plasma glucose, HbA1c and cholesterol levels

Source: Own authorship, 2022.

Forms of consumption and effects of the use of medicinal plants

The main forms of consumption of medicinal plants include: powder, extract, fresh fruit, frozen, steam bath, and syrups[9,11,14,18]. Given the various interventions, these were characterized according to Table 5.

Table 5 - Characterization of interventions according to medicinal plant, pathology, and method of consumption. Caxias, MA, Brazil, 2022.

Author ande year	Medicinal plant or phytotherapeutic studied	Pathology studied	Consumption method
Zojaji et al[8]	*Anethum graveolens* (endro) *Citrus aurantium* (Laranja-da-Terra) *Cynara scolymus* (alcachofra) *Portulaca oleracea* (beldroega) *Silybum marianum* (cardo de leite)	Non-alcoholic fatty liver disease	Capsules
Tungsukruthai et al[9]	*Zingiber cassumunar* (gengibre cassumunar) *Curcuma longa* (açafrão-da-terra) Kaempferia galanga L. (Cananga-do-Japão) Acorus calamus L. (cana-cheirosa) *Tamarindus indica* (tamarindo) *Cinnamomum camphora* (L.) Presl. (canforeira) *Dryobalanops aromatica Gaertn.* (cânfora-de-bornéu)	Allergic rhinitis	Herbal steam bath
Zhang e Qin[10]	*Ixeris sonchifolia Hance*	Coronary disease a Dyslipidemia in diabetic patients	Injection

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		nd diabetes mellitus	
Swathi, Shetty e Shetty[11]	*Garcinia Indica* (Kokum)	Gastritis	Kokum husks soaked in water
Mohammadi-Araghi et al[12]	*Drimia maritima* (cebola-albarrã)	Chronic obstructive pulmonary disease	Syrup
Meir et al[13]	*Wolfia globosa* (farinha de água asiática)	Non-alcoholic fatty liver disease	Green Shake
Geberemeskel, Debebe e Nguse[14]	*Trigonella foenum-graecum* (feno grego)	Dyslipidemia in diabetic patients	Powder extracted from seeds
Sung et al[15]	Ginseng vermelho coreano	chronic fatigue	Capsules
Samaha et al[16]	*Mentha longifólia* (menta-silvestre) Viola odorata Urtica dioica *Allium ampeloprasum* (Alho-porro-bravo) *Apium graveolens* (salsão) *Crataegus azarolus*	Hypertension	Plant extract
Abdulazeez et al[17]	*H. sabdariffa* (Caruru-azedo)	Hypertension	Plant extract
Carvalho et al[18]	Bluberry	Metabolic syndrome	Juice, fruit
Mehrzadi et al[19]	*Capparis spinosa* (alcaparra) *Securidaca securigera* Rosa canina Urtica dioica *Silybum marianum* (cardo de leite) *Vaccinium arctostaphylos* (mirtilo caucasiano) *Trigonella foenum-graecum* (feno grego)	Diabetes	Capsules

Source: Own authorship, 2022.

DISCUSSION

Benefits of using medicinal plants to control chronic non-communicable diseases

When evaluating the effects of a combination of Anethum graveolens, Citrus aurantium, Cynara scolymus, Portulaca oleracea and Silybum marianum in the treatment of non-alcoholic fatty liver disease, Zojaji et al[8] found significant improvement in the degree of fatty liver and a decrease in serum levels of liver enzymes and total cholesterol, which was attributed to the fact that the five plants have antioxidant, anti-inflammatory and hepatoprotective activities.

Also addressing the treatment of non-alcoholic fatty liver disease, Meir et al[13] tested the efficacy of the green Mediterranean diet, more restricted in red/processed meat and enriched with green plants and polyphenols, and demonstrated that the prevalence of the disease was reduced by half and intrahepatic fat was reduced. Polyphenols play a role in decreasing hepatic steatosis through several mechanisms,

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such as reducing lipogenesis and oxidative stress, and increasing fatty acid oxidation.

In their study, Tungsukruthai et al[9] demonstrated that herbal steam bath with Zingiber cassumunar, Curcuma longa, Tamarindus indica, Cinnamomum camphora (L.) Presl., Dryobalanops aromatica Gaertn., Kaempferia galanga L, Acorus calamus L in allergic rhinitis causes significant reductions in symptoms such as runny nose, sneezing, itchy nose, nasal congestion and watery eyes, which is explained by the fact that some compounds of the herbs inhibit the total production of mucin, in addition, heat and water cause an increase in temperature and dilution of the nasal mucosa, reducing the osmolality of secretions.

Fenugreek seed powder (Trigonella foenum-graecum L.) showed potential antidyslipidemic effect in patients with type II diabetes, reducing levels of total cholesterol, triglycerides and LDL-C, however its mechanism of action is not fully explained, it is only suspected that fenugreek slows the absorption of glucose and fatty acids, providing less substrate for the synthesis of triglycerides[14]. Patients with type II diabetes were also studied by Mehrzadi et al[19], who tested a combination of Capparis spinosa, Rosa canina, Securidaca securigera, Silybum marianum, Urtica dioica, Trigonella foenumgraecum and Vaccinium arctostaphylos, and obtained results in decreased fasting plasma glucose, HbA1c and cholesterol levels, which were explained by the ability of these herbs to inhibit hepatic gluconeogenesis by reducing the hepatic enzyme glucose-6-phosphatase, increasing insulin secretion and inhibiting pancreatic amylase.

The authors Zhang and Qin[10] investigated the benefits of an injection of Ixeris sonchifolia Hance combined with isosorbide mononitrate in patients with coronary heart disease and diabetes. They concluded that the injection is effective in controlling left ventricular end-diastolic pressure, left ventricular end-systolic volume and left ventricular function by activating the enzyme guanylate cyclase, which improves the effect of cyclic protein phosphate on smooth muscle cells, expanding peripheral arteries and veins, and increasing venous blood volume.

The antihypertensive capacity of some medicinal plants was also investigated. In their study, Samaha et al[16] reported that Mentha longifolia, Viola odorata and Urtica dioica are capable of reducing systolic and diastolic blood pressure and mean arterial pressure due to their flavonoid components (hyperoside, quercetin, rutin and vitexin), oligomeric proanthocyanidins and quercetin, which cause vasorelaxation and inhibit the angiotensin-converting enzyme. Similar to this, Abdulazeez et al[17] reported in their findings 16 different plants used for the treatment of hypertensive patients, having in common secondary metabolites such as phenolics, flavonoids, alkaloids and vitamins responsible for the therapeutic effects observed.

Honey combined with medicinal plants has also shown benefits. Kokum bark extract (Garcinia Indica) with honey has shown efficacy

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in relieving symptoms of chronic gastritis, in which such improvements may be associated with the neutralizing and antacid activity of garcinia and the acidic pH of honey that prevents the growth of H. pylori[11]. In the research by Mohammadi-Araghi et al[12], honey and vinegar were added to Drimia maritima (Squill-Oxymel) and used in the complementary treatment of chronic obstructive pulmonary disease, where they demonstrated bronchodilator properties mainly due to their anti-inflammatory, antioxidant, antibacterial, anticholinergic and mucus production regulating properties.

In addition to these medicinal plants, blueberry and Korean red ginseng (Panax ginseng) were also addressed in the studies. It has been proven that blueberry supplementation is capable of improving parameters related to metabolic syndrome, having an effect on lipid levels, reducing total cholesterol and low-density lipoprotein, as blueberries have several nutrients and bioactive compounds, such as anthocyanins and vitamin C, which have antioxidant, anti-inflammatory and cardioprotective properties[18]. In turn, Korean red ginseng has therapeutic potential for middle-aged individuals with moderate fatigue due to its antioxidant effects and its influence on cortisol levels[15].

Consumption method and effects of the use of medicinal plants in people with chronic diseases

There are several ways to take advantage of the benefits of medicinal plants and nutraceutical foods to treat numerous pathologies, but the most common forms of use should be highlighted, including: powder, extract, fresh fruit, and frozen[18]. In this sense, Samaha et al[16] argue that the intake of 300 mL/day of plant extracts of Mentha longifolia, Viola odorata, and urtica dioica for 16 weeks is an effective dosage for treating mild hypertension.

Currently, many people prefer to take medicine capsules or supplements, and much research on medicinal plants is dedicated to developing their products in this format, in which some formulations are effective in treating conditions related to type II diabetes[19]. It should be mentioned that each study has its own methodology depending on the substances studied and the disease that it aims to treat, where Zojaji et al[8] showed that 2 capsules, three times a day, for two months, based on herbs, were positive in the treatment of non-alcoholic fatty liver disease.

Other ways to take advantage of the medicinal properties of plants include steam baths, which are effective in the treatment of allergic rhinitis and should be used weekly[9]. It should be added that the consumption of nutraceutical powder foods is also beneficial and 25 mg of fenugreek powder for 30 days can act in the treatment of dyslipidemia in patients with diabetes[14].

Syrups are also still widely used, in this sense gastritis can also be treated with a formula based on Kokum bark and honey, reducing some symptoms of the pathology in three weeks[11].

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Chronic obstructive pulmonary disease (COPD) is another well-researched disease, where a herbal and honey-based syrup used for four weeks has also been shown to be effective in complementing therapy in COPD patients[12].

Safety and adverse effects associated with the use of medicinal plants in the treatment of chronic diseases

The evidence found suggests that the use of medicinal plants in general as an alternative treatment for chronic diseases is safe and well tolerated. However, further studies are needed to evaluate the efficacy and safe dosage for use, in addition to the adverse effects that may occur.

Various and low-grade adverse effects were reported in some studies. In the study by Zojaji et al[8], when using a plant compound to treat non-alcoholic fatty liver disease, at least one patient of the 46 participants in the study experienced dizziness or some allergic symptom when consuming the compound.

Another study that also evaluated the consumption of plants in the treatment of chronic diseases, in this case for chronic gastritis, used a mixture of kokum and honey, and no side effects were found, highlighting that the mixture can be a safe and economical therapy[11].

In the studies by Samaha et al[16] that evaluated three types of medicinal plants (M. longifolia, V. odorata and U. dioica) popularly known in Libya for the treatment of hypertension, they highlighted that there is a great limitation regarding the dose-response in the use of medicinal plants, but the findings determined that the plants used have a safe and promising potential for the management of hypertension, with no adverse effects mentioned.

Abdulazeez et al[17] highlighted that in general, plant extracts do not seem to cause adverse effects or toxic reactions, but there have been studies with tests carried out on animals that reported mortality due to herbal medicines, but with high doses. Therefore, there is a need to standardize the dosages of extracts with potential use as alternative therapy, as this would be essential to reveal the real efficacy and safe clinical application.

Studies conducted with Squill-Oxymel, a plant-based phytotherapeutic, also found no side effects during or after the research, and it is considered safe as a complementary therapy for COPD[12].

In addition, attention should be paid to other factors that may influence the benefits or harms of phytotherapeutic therapy, such as in the studies by Tungsukruthai et al[9], with an intervention of steam bath with herbs for the treatment of chronic rhinitis, in which the steam bath or sauna technique itself has some considerations, such as risk to pregnant women, people with heart problems and hypertension, and alcohol consumption in these places should be avoided. The results of this study did not find any serious adverse effects, only one participant had itching, but this was treated and resolved quickly.

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It is important to note that although most studies indicate that herbal medicines have the potential for efficacy and safety in clinical practice, it is necessary to develop interventional studies that can add significant data for the standardization, distribution and use of herbal medicines in the most varied chronic diseases, as they represent an economical and viable therapeutic arsenal for the general population.

FINAL CONSIDERATIONS

The use of medicinal plants in the control of chronic non-communicable diseases has potential benefits in clinical practice. The main medicinal plants used include Korean red ginseng, dill, milk thistle, eleven-hours, kokum, blueberry, honey, among others. Among the diseases that showed improvement with the use of plants, hypertension, COPD, fatigue, dyslipidemia, among others, stood out.

However, it is necessary for health professionals to be knowledgeable about the use of medicinal plants, understanding their dynamism with the culture and history of certain communities and groups. At this point, it is worth highlighting that nursing is in constant contact with patients and can seek complementary alternative therapies that assist in the treatment of patients with chronic non-communicable diseases and various acute pathologies, where Brazil presents the National Policy on Medicinal Plants and Phytotherapeutics to support the clinical practice of health professionals and provide appropriate and safe guidance.

The limitations of this study include the lack of research on dosage and responses to the use of extracts and more in-depth verifications of the safety of medicinal plants, as well as the lack of studies on Brazilian medicinal plants in the international literature, where studies on Brazilian flora should be encouraged, since the country is rich in biodiversity.

Finally, this study made it possible to expand knowledge about some chronic non-communicable diseases and the role of medicinal plants. Therefore, it is considered that new research should be carried out in this line of investigation, in order to prove the benefits of using medicinal plants to treat various pathologies.

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Hálmisson D'Árley Santos Siqueira, Rodolfo Ritchelle Lima dos Santos: Responsible for all aspects of the study, ensuring issues of accuracy or integrity of any part of the study

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Declaration of conflict of interest
Nothing to declare

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