Revista de Ciencias Médicas de Pinar del Río

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

ORIGINAL ARTICLE

Knowledge and use of medicinal plants for the control of glycemia in diabetic patients

Conocimiento y uso de plantas medicinales para el control de la glicemia de los pacientes diabéticos

Mery Angelica Alvarez Villa-Marin[1], Melanie Shakira Barrera-Bonilla[1], Michelle Carolina Arias-Murillo[1], Luis Eduardo Álvarez-Cortes[2]

[1]Universidad Regional Autónoma de los Andes "UNIANDES", Facultad de Ciencias Médicas. Ambato. Ecuador.
[2]Universidad Estatal Amazónica. Ecuador.

Received: February 25, 2025
Accepted: April 5, 2025
Published: April 12, 2025

Citar como: Alvarez Villa-Marin MA, Barrera-Bonilla MS, Arias-Murillo MC, Álvarez-Cortes LE. Conocimiento y uso de plantas medicinales para el control de la glicemia de los pacientes diabéticos. Rev Ciencias Médicas [Internet]. 2025 [citado: fecha de acceso]; 29(2025): e6686. Disponible en: http://revcmpinar.sld.cu/index.php/publicaciones/article/view/6686

ABSTRACT

Introduction: the knowledge and use of medicinal plants for the control of glycemia in diabetic patients is a complex subject of great interest, but it also requires a cautious and responsible approach. Therefore, the study of diabetes is extremely important in prevention and health care.
Objective: to determine the level of knowledge and use of medicinal plants for the control of glycemia in diabetic patients of the diabetic club of the Santa Rosa Health Center.
Methods: it is an observational, descriptive study; an analysis is made from the types of diabetes, alternative therapies with medicinal plants, antidiabetic medicinal plants in Ecuador and their use by patients.
Results: as part of the diagnosis, the demographic data of patients with hyperglycemia, the most prevalent diseases in patients of the Club, as well as the medicinal plants most known by patients for the control of glycemia, their preparation methods and the most used means of information for the use of plants were used.
Conclusions: traditional medicine is one of the main treatments to which patients have access, and the perception in favor of the use of plants to reduce glucose levels is high, and studies and attention are intended in this sense.

Keywords: Diabetes Mellitus; Health; Medicine, Traditional.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

RESUMEN

Introducción: el conocimiento y uso de plantas medicinales para el control de la glicemia en pacientes diabéticos es un tema complejo y de gran interés, pero también requiere un enfoque cauteloso y responsable. Por lo que el estudio de la diabetes es sumamente importante en la prevención y atención de salud.
Objetivo: determinar el nivel de conocimiento y uso de plantas medicinales para el control de la glicemia de los pacientes diabéticos del club de diabéticos del Centro de Salud Santa Rosa.
Métodos: es un estudio observacional, descriptivo; se realiza un análisis desde los tipos de Diabetes, terapias alternativas con plantas medicinales, plantas medicinales antidiabéticas en Ecuador y su uso por parte de los pacientes.
Resultados: como parte del diagnóstico se parte de los datos demográficos de los pacientes con hiperglicemia, las enfermedades con mayor prevalencia en pacientes del Club, así como las plantas medicinales más conocidas por los pacientes para el control de la glicemia, sus métodos de preparación y los medios de información más usados parar el uso de las plantas.
Conclusiones: la medicina tradicional es uno de los principales tratamientos a los que acceden los pacientes, y la percepción a favor del uso de plantas para reducir los niveles de glucosa es alta, intencionando los estudios y atención, en este sentido.

Palabras clave: Diabetes Mellitus; Salud; Medicina Tradicional.

INTRODUCTION

DiabetesmellitusIt is a disease that affects all people regardless of age, race, gender, or social status. According to information provided by the International Diabetes Federation (IDF), 415 million people worldwide have been diagnosed with this disease, and the number is projected to reach 640 million by 2040.

Diabetes is a chronic metabolic disorder of multiple etiologies that occurs when the body is unable to produce sufficient insulin or cannot use insulin effectively; this causes glucose to remain circulating in the bloodstream, resulting in increased urine production and elimination.[1]

It can cause consequences such as persistent hyperglycemia, alterations in carbohydrate, fat, and protein metabolism, and cytotoxicity with an increased risk of complications from valvular heart disease. The etymology refers to increased glucose levels, from the Latin mellitus, meaning sweet.[1]

The most characteristic symptoms are: polyphagia (increased appetite), polyuria (frequent desire to urinate), polydipsia (excessive thirst) and weight loss.[1]

This disease has a high prevalence worldwide. According to WHO studies, the number of people with diabetes has increased from 108 million in 1980 to 422 million in 2014. In 2015, 1.9 million people died as a result. More than 80% of deaths from diabetes occur in low- and middle-income countries. Scientific advances indicate that it will be the seventh leading cause of death by 2030.[1]

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

Adults with this condition have a two- to three-fold increased risk of heart disease and stroke. Diabetic retinopathy is one of the leading causes of blindness, accounting for 2,6 % of cases.[1]

Several types of DM have been identified, depending on the classification used. However, the most widely used is the one that divides it into type I DM, type II DM, and gestational DM. Type I DM, also known as insulin-dependent or juvenile-onset diabetes, is characterized by deficient insulin production and requires daily insulin administration. This type of diabetes cannot be prevented today because the cause is unknown. Type II DM, non-insulin-dependent or adult-onset, is due to cells not using insulin effectively despite adequate insulin production. It is the most common and is closely linked to obesity and lack of physical exercise. Gestational diabetes, on the other hand, is that which occurs during pregnancy, characterized by hyperglycemia with values below those established to diagnose diabetes. Women who suffer from this type of diabetes do not usually have symptoms, but they are at greater risk during pregnancy, and the risk of developing type II diabetes in the future increases considerably for both the woman and her child.[1,2,3]

The treatment is established from pharmacological and non-pharmacological therapy, being an indispensable and first-line element.Lifestyle modification is essential for the prevention and metabolic control of type II diabetic patients. However, this tends to be displaced by many patients, with the use of drugs being more common as the only line of treatment.[4]

The use of medicinal plants to improve the disease is one of the complementary, but not substitute, alternatives in the treatment of the disease, showing beneficial effects to control the blood glucose level, so they can favor the reduction of the dose of medications to be prescribed.[5,6]

Ecuador is full of living cultural wealth, both tangible and intangible, and as indicated by the National Institute of Cultural Heritage (INPC), intangible cultural heritage includes customs and traditions, in addition to the living culture that has managed to transcend due to its antiquity and ancestral medicine.[7]

The knowledge and uses of medicinal plants to preserve health have spread from rural villages to different cities through the direct sale of their derivatives, which are consumed traditionally or based on experience and observation of the facts to treat different health problems.[6]

The WHO Strategy on Traditional Medicine 2014–2023 was developed in response to the World Health Assembly resolution on traditional medicine. The objectives of the strategy are to support Member States in harnessing the potential contribution of traditional medicine to health, well-being and people-centred health care, and to promote the safe and effective use of traditional medicine through regulation and research, and through the incorporation of products, practitioners and practices into health systems.[8]

In Ecuador, chronic degenerative diseases represent a serious public health problem. According to data from the 2013 National Institute of Statistics and Census (INEC), diabetes mellitus and hypertensive diseases were the leading causes of death, accounting for 7,44 % and 6,64 %, respectively.[9]

Several medicinal plant extracts have been shown to modulate metabolic pathways such as glycolysis, gluconeogenesis, the Krebs cycle, glycogen synthesis and degradation, insulin synthesis and release, cholesterol synthesis, carbohydrate metabolism and absorption.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

There are many medicinal plants useful for DM type II, however, in the context of researchers, among the most used are*Linum usitatissimum L*, Artocarpus altilis, Cucumis sativus, Apium graveolens, Bixa orellana.[10]

He The objective of this article is toDetermine the level of knowledge and use of medicinal plants for the control of glycemia in diabetic patients.Diabetic Club of the Santa Rosa Health Center.

METHODS

An observational, descriptive study is carried out in theDiabetic Club of the Santa Rosa Health Centerof the province of Chimborazo, Ecuador during the year 2023. The study population consisted of the 40 diabetic patients treated at said center, all of whom were studied.

Theoretical and empirical methods were used to develop the study. Among the theoretical methods used was the historical-logical method, which allows us to determine that diabetes is not a random problem, but rather the result of a process originating from a cause and bringing negative consequences and effects to the diabetic patients at the club. This led to logical decisions that guide patients toward consuming natural products that benefit their health and quality of life. Similarly, the analytical-synthetic method was used, which allowed us to break down the phenomenon under investigation, to understand its multiple relationships, and to arrive at synthesized reasoning about the information related to the consumption of medicinal plants and their benefits in improving the health of the diabetic patients at the club.For its part, the inductive-deductive method made it possible to achieve the necessary abstractions that allowed us to discover the regularities that typifythe establishment of the general topic on the role of nursing staff in diabetic patients, as well as the epidemiology, etiology, causes, and complications.

Among the empirical level methods, the survey and the in-depth interview were applied to patients and health personnel, aimed at obtaining information on the prevalence ofUse of medicinal plants for the control of glycemia in diabetic patientsDiabetic Club of the Santa Rosa Health Center. The interview contained main and supporting questions, grouped into areas of interest: preparation, commonly used sources of information, impact and implications of the application and/orI use medicinal plants to control blood sugar levels.

A database was created from the data obtained after administering the instruments and analyzed using SPSS 21.0 statistical software. Descriptive statistics were used to analyze the data, calculating absolute and relative frequencies as percentages.

The Center's Scientific Council and specialists in the field approved the study. Participants gave their consent after being informed of the research objective, its scientific purposes, and the confidential treatment of their personal data, in accordance with the ethical principles and aspects established in the Declaration of Helsinki.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

RESULTS

The club's study population comprised 100% of older adults, between the ages of 65 and 80. The male-to-female ratio was 1,6 men for every woman (25 vs. 15), with 62,5 % being male. Seventy-five percent of the patients were married. 37,5 % of the patients reported no education, and 62,5 % were high school graduates (Table 1).

Table 1. Demographic data of patients with hyperglycemia.

Variables		Number of patients	Percentage %
Age	65 and over	40	100
Sex	Male	25	62,5
	Female	15	37,5
Schooling	Bachelor	25	62,5
	Technical	0	0
	Degree	0	0
	Mastery	0	0
	None	15	37,5
Marital status	Single	0	0
	Married	30	75
	Widower	5	12,5
	Divorced	5	12,5

62,5 % of patients had type I diabetes and 37,5 % had type II DM. The main comorbidities identified in the patients were arterial hypertension (87,5 %) and rheumatism (75 %) (Table 2).

Table 2. Comorbidities present in patients.

Disease	No.	%
High blood pressure	35	87,5
Insomnia	15	37,5
Rheumatism	30	75

Regarding the type of pharmacological treatment used by patients, 75 % maintain conventional or pharmacological treatment with sulfonylureas, biguanides, or combination medications. Ten patients use only medicinal plants. Similarly, 100 % of patients who use pharmacological therapy use medicinal plants as an adjuvant. Similarly, 100 % of patients are fully aware of the existence and use of medicinal plants in the greenhouse of the Santa Rosa Diabetic Club.

Table 3 shows the list of plants grown in the Santa Rosa greenhouse; diabetic club patients perceive that 64,2 % of them have hypoglycemic benefits and encourage their consumption to alleviate their underlying condition. Flaxseed and lemon balm (17,5 % each) are most commonly consumed; while cinnamon and mint are the least consumed plants for blood sugar control (5 % each).

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

Table 3. Medicinal plants known and used for glycemic control.

FLOORS	No.	%
Mint (Mentha x piperitae)	2	5
Cinnamon (Cinnamomum zeylanicum/cassia)	2	5
Aloe vera	4	10
Flaxseed (Linum usitatissimum)	7	17,5
Lemon balm (Melissa officinalis)	7	17,5
Jicama (Smallamthus sonchifolius)	5	12,5
Plantain (Plantago major)	3	7,5
Herb Luiza (Aloysia citrodora)	5	12,5
Others	5	12,5

95 % of patients reportedthat treatment with antidiabetic medicinal plants is more effective than treatment with conventional medicine, while 5 % of patients did not consider it more effective. 87,5 % of patients stated that they always prepare remedies with medicinal plants, and 12,5 % do so occasionally.

62,5 % of patients reported consuming the leaves of the plants for the treatment of DM. Infusion was the main method of preparation (75 %) (Table 4).

Table 4. Parts of the plant for the treatment of diabetes mellitus.

Variable	Scale	No.	%
Parts of the plant	Leaves	25	62,5
	Fruit	4	10
	Stem	8	20
	The entire plant	3	7,5
Preparation methods	Infusion	30	75
	Natural consumption	10	25

Regarding the primary means of information for learning about the benefits of using medicinal plants, 62,5 % of patients referred to friends. 12,5 % mentioned healthcare professionals or books (Table 5).

Table 5. Media on the use of medicinal plants.

Media	Number of patients	Percentage
Health personnel	5	12,5
Friends	25	62,5
Relatives	3	7,5
Former coworkers	2	5
Books	5	12,5

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

DISCUSSION

Green Medicine or Natural and Traditional Medicine has been established as a science, with its laws, norms, regularities and principles, andOver the years, science has recognized popular knowledge within scientific knowledge, defined as that which is transmitted from person to person, known in our country as ancestral medicine. Currently, traditional medicine has become a complementary option to pharmacological therapy in the treatment of many diseases, as mentioned byLobaina Rodriguez.[11]

As in Cuba, in Ecuador traditional medicine in some communities has not been replaced by Western medicine. Therefore, every health professional must be aware that ancestral practices cannot be replaced, which are increasing exponentially. This is why there is a need to study the efficacy of certain plants for the treatment of chronic diseases such as diabetes mellitus, with the aim of adding them to medical therapy.

When performing an analysis of the systematic review conducted by Gallego Muñoz et al.,[12] in which laboratory methods are mentioned for verification of both glycemia and HbA1c for monitoring results, several plants are mentioned such as bitter melon which reduces 0.22% of glycosylated hemoglobin, talks about a dose of bitter melon of 2000mg each day, in our study this fruit is not taken as a treatment option, given the poor production of it in the country, cinnamon is well known in the country in our study 5 % of patients consume it for a hypoglycemic purpose, the effect of coumarin derivatives in our patients is unknown, despite this the authors report that the consumption of 2 grams per day for a period of four to 16 weeks have statistical significance for the reduction of glycemia levels.

Castro Juárez et al.,[13] in the study carried out with the Oaxacan community in Mexico on the use of medicinal plants speaks of aloe with a consumption of the leaf in decoction speaks of the study of metabolites such as chromium, magnesium, zinc and vitamins A and E as those responsible for the hypoglycemic action and the plant, in our study aloe vera is included among the most used by our older adults (10 %), the average dose of aloe vera used in a study with rats was 0.5ml / day for five weeks in addition to the benefit for diabetes control was found reduction in lipid profile values, which strengthens that the knowledge of phytotherapy as an adjuvant to the treatment of chronic diseases is a valid option along with pharmacological treatment, this is confirmed by José Luis Ríos in a complete review published in 2016 who confirms with aloe vera with a maximum dose of 15g per day the reduction of HbA1c, HOMA index, Basal Glycemia, to Talking about cinnamon refers to a maximum dose of 10g/day with a significant reduction in basal glucose, HbA1c, and glucose intolerance, unlike our study in which this author published garlic does not represent any benefit in reducing glycemia.

Regarding consumption, there is talk of the benefits provided by the plant, such as reduced glucose absorption, decreased glucose synthesis, and increased insulin secretion. Despite this, our patients do not take glucose as a medicinal plant that provides benefits in their treatment. Thus, no patient added it to their daily diet.

Therefore, the use of medicinal plants for controlling blood sugar levels in diabetic patients is an important alternative, but it must be done after prior medical consultation. A comprehensive approach with a healthy diet, regular exercise, medications (if necessary), and diabetes education is essential for good disease control.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

That is why, supported by what was raised byByMeza Palomino et al.,[14] health services must work with quality since errors can cause major consequences for people's well-being, in this sense health entities must continuously improve the quality of their processes to always satisfy the needs and expectations of patients.

Therefore, further research is required that includes the dynamic observation of plasma glucose values, both basal and postprandial, as well as glycosylated hemoglobin, along with the consumption of medicinal plants, in order to observe the true effects that these have on the control of diabetes mellitus. However, our study allows us to establish a consumption guideline for these plants.

Health care workers must have extensive knowledge of ancestral medicine in order to guide patients in their use of these remedies and avoid adverse effects or discontinuation of drug therapy.

CONCLUSIONS

Traditional medicine is one of the main treatments available to seniors at the Santa Rosa Health Center's Diabetic Club for the treatment of diabetes mellitus.A large number of patients perceive the usefulness of medicinal plants in reducing blood glucose levels, reporting greater benefits compared to pharmacological therapy.Patients reported that consuming natural medicinal plants grown in the greenhouse helps control blood sugar and other diseases, with flaxseed and lemon balm being the most commonly consumed.It is necessary to train health personnel in the use of medicinal plants in the treatment of various diseases.

Conflict of Interest
The authors declare that there is no conflict of interest.

Author contributions
MAAVM: Conceptualization, bibliographic search, statistical work, writing, review and final approval of the manuscript.
DSAF: Conceptualization, bibliographic search, writing, final revision of the manuscript.
MJAM: Conceptualization, bibliographic search, writing, final revision of the manuscript.
LEAC: Survey application, writing, grammar and spelling review, final approval of the manuscript.

Financing
It did not exist

BIBLIOGRAPHIC REFERENCES

1. Gutiérrez Hervás, M. Plantas medicinales empleadas como antidiabéticas en la medicina tradicional de áreas tropicales. Universidad de Sevilla, Sevilla[internet]; 2019[citado 20/12/2024]. Disponible en: https://idus.us.es/items/dcc36abc-72c6-4365-a037-daa72eb6c080

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

2. Pinilla-Roa AE, Barrera-Perdomo M del P. Prevención en diabetes mellitus y riesgo cardiovascular: enfoque médico y nutricional. Rev.Fac.Med [internet]. 2018[citado 20/12/2024]; 66(3): 459-468. Disponible en:https://revistas.unal.edu.co/index.php/revfacmed/article/view/60060

3. Guías ALAD sobre el Diagnóstico, Control y Tratamiento de la Diabetes Mellitus Tipo 2 con Medicina Basada en Evidencia Edición 2019. ALAD Asociación Latinoamericana de Diabetes[internet]; 2019 [citado 20/12/2024]. Disponible en: https://revistaalad.com/guias/5600AX191_guias_alad_2019.pdf

4. Mata-Cases M, Artola S, Escalada J, Ezkurra-Loyola P, Ferrer-García JC, Fornos JA. Consenso sobre la detección y el manejo de la prediabetes. Grupo de Trabajo de Consensos y Guías Clínicas de la Sociedad Española de Diabetes. Aten Primaria[internet]. 2015 Aug [citado 20/12/2024]; 47(7): 456–68. Disponible en: https://doi.org/10.1016/j.aprim.2014.12.002

5. +35 plantas medicinales para la diabetes - Lista y 5 recetas[internet]; 2023. Disponible en: https://www.ecologiaverde.com/plantas-medicinales-para-la-diabetes-2888.html

6. Cuenca-Villalobos LP, Uriartes-Sandoval MA, Rodrìguez-Dìaz JL, Parcon-VBitanga M. Uso de la medicina no convencional por pacientes diabéticos. Rev. AMC [Internet]. 2020 [citado 22/12/2024]; 24(1): e6632. Disponible en: https://www.redalyc.org/journal/2111/211166479007/html/

7. Guacho-Quezada DE. Estudio de la Medicina Tradicional como Potencial Atractivo Turístico en el Cantón Cuenca. Universidad de Cuenca. Facultad de Ciencias de la Hospitalidad Carrera Turismo[internet]; 2013 [citado 22/12/2024]. Disponible en: http://dspace.ucuenca.edu.ec/bitstream/123456789/4892/3/Tesis.pdf

8. Organización Mundial de la Salud. Estrategia de la OMS sobre medicina tradicional 2014-2023[internet]; 2013 [citado 22/12/2024]. Disponible en: https://www.redalyc.org/articulo.oa?id=427750771011

9. Moreno Maldonado K, Jaramillo Jaramillo C, Moreira M, Gastón Garcia S, Rojas de Astudillo l. Investigaciones etnobotánicas, fitoquímicas, antioxidantes y preclínicas en cinco plantas medicinales que se consumen como antidiabéticas en Machala, provincia de El Oro, Ecuador. R. Revista Multidisciplinaria del Consejo de Investigación de la Universidad de Oriente[Internet]. 2016 [citado 22/12/2024]; 28(3). Disponible en: https://www.redalyc.org/articulo.oa?id=427750771011

10. Chú ÁJ, Víctor L, Lanchi G, Sixto Z, Chiliquinga Villacis I. Enfermedades metabólicas: punto de vista desde diversas especialidades médicas. 2019. Universidad Técnica de Machala[internet]; 2018 [citado 26/1/2025]. Disponible en: https://repositorio.utmachala.edu.ec/handle/48000/12519

11. Izquierdo Cirer A, Mendoza Rodríguez D, Álvarez Pavón G, Lobaina Rodríguez DR, Sarría Pérez CA. Aspectos teóricos y tendencias del Diseño Curricular Postgraduado en Tecnología de la Salud. Rev. Cub. Tecnol. Salud. [Internet]. 2011 [citado 12/12/2024]; 2(1). Disponible en: https://revtecnologia.sld.cu/index.php/tec/article/view/21

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6686

12. Gallego Muñoz C, Martínez Bautista MJ, Guerrero Navarro N, Romero Hernández I, García Martín F, Manzano Martín MV. Manejo del dolor en el paciente oncológico pediátrico y factores que influyen en su percepción. Rev Cubana Farm [Internet]. 2015 Jun [citado 12/12/2024]; 49(2): 394-411. Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0034-75152015000200017&lng=es

13. Castro Juárez CJ, Villa Ruano N, Ramírez García SA, Mosso González C. Uso medicinal de plantas antidiabéticas en el legado etnobotánico oaxaqueño. Rev Cubana Plant Med[internet]. 2014 [citado 12/12/2024]; 19(1): 101-120.. Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1028-47962014000100012

14. Meza Palomino RA, García González M, Heredia Llatas FD, Fernández Otoya FA. Modelo de gestión de calidad para desarrollar la telerehabilitación. Revista Cubana de Educación Superior[internet]. 2024[citado 20/1/2025]; 43(2): 28-37. Disponible en: https://revistas.uh.cu/rces/article/view/9481