Chapter 3 Use of medicinal plants by dentists in the state of Guerrero, Mexico

Capítulo 3 Uso de plantas medicinales por odontólogos en el estado de Guerrero, México

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Abstract

Objective: To identify some medicinal plants used by dentists in their clinical practice for the treatment of oral diseases Methods: A survey was applied to identify the use of plants by dentists in the state Guerrero state, the oral pathologies in which they are applied, and frequency of use Results: 21% (22) of the dentists use medicinal plants in their clinical practice, 77% of the dentists who use plants, report having obtained knowledge by local tradition Contribution: 22 plants were identified for use in pathologies oral, the most used was the clove with 27% (6) and the paulillo with 18% (4). Conclusion: 21% of the dentists in the state of Guerrero who participated in the study use medicinal plants in their professional practice based mostly on the knowledge of traditional medicine. The sociodemographic characteristics of the dentists did not show differences between the use or not of medicinal plants.

Medicinal plants, Dentistry, Oral pathologies

Resumen

Objetivo: Identificar algunas plantas medicinales utilizadas por los odontólogos en su práctica clínica para el tratamiento de enfermedades bucales Métodos: Se aplicó una encuesta para identificar el uso de plantas por parte de los odontólogos del estado de Guerrero, las patologías orales en las que se aplican y la frecuencia de uso Resultados: El 21% (22) de los odontólogos utilizan plantas medicinales en su práctica clínica, el 77% de los odontólogos que utilizan plantas, reportan haber obtenido el conocimiento por tradición local Contribución: Se identificaron 22 plantas para su uso en patologías orales, la más utilizada fue el clavo de olor con 27% (6) y el paulillo con 18% (4). Conclusión: El 21% de los odontólogos del estado de Guerrero que participaron en el estudio utilizan plantas medicinales en su práctica profesional basándose principalmente en el conocimiento de la medicina tradicional. Las características sociodemográficas de los odontólogos no mostraron diferencias entre el uso o no de plantas medicinales.

Plantas medicinales, Odontólogos, Patologías orales

3.1 Introduction

We will explain in general the importance of the use of medicinal plants, as it seems to be in apogee nowadays, however, we must remember that their use has been proposed since ancient times, the use of plants has been documented by ancient civilisations such as the Chinese and Indian cultures, for the treatment of different diseases, interestingly both countries have integrated traditional medicine in their national health programmes. Mexico has an ancient tradition in the use of medicinal plants, in fact it is considered that after China, our country has the largest number of inventoried medicinal plants" it is also noteworthy that 80% of the Mexican population makes frequent use of herbal medicine, it is estimated a record of 4, 500 plants of which 3,000 are registered in the IMSS Herbarium, Mexico also has the Herbal Pharmacopoeia of the United Mexican States (FHEUM), a document issued by the Ministry of Health that sets out the general methods of analysis and technical specifications that plants and their derivatives used in the production of herbal medicines and remedies must comply with (Biodiversidad, 2022; Pharmacopoeia, 2022). Plants have been used since prehistoric times as medicines; health among cultures such as the Nahuatl and Mayan was obtained with treatments that required natural alternatives to heal and treat illnesses. With the arrival of the Spanish in Mexico in the 16th century, Fray Bernardino de Sahagún, who was interested in the myths, customs and, of course, the diseases and plant resources that were used to treat the health of the population, compiled in the book Historia general de las cosas de la Nueva España, written in 1548, the names in Nahuatl of the plants that were used for certain ailments. Many of the uses survive today thanks to the application of herbal medicine, which is a basic resource in the cure of the most common illnesses. Thanks to the fact that Mexico has a very diverse flora, its herbal medicine is one of the most varied, as it includes hundreds of home remedies that are used in infusions, poultices or in salads, to cure different ailments. Herbal medicine is based on the presence of chemical compounds with pharmacological actions in plant species, which constitute the primary ingredients that pharmaceutical laboratories use in their patented commercial medicines (Government of Mexico, 2020).

It is important to know about this topic because the familiarity that the population has with the use of medicinal plants has led to the increasing use of herbal medicine as an adjuvant in the treatment of different pathologies. This makes us think that health professionals may be using traditional medicine for the treatment or adjuvant to treat various pathologies, even sometimes on a daily basis, such as the use of cloves for dental pain.

The added value of this work is that by identifying the medicinal plants used by dentists, it will allow us to link herbal medicine with clinical practice. It can also guide basic science researchers in investigating the effects of plants that may not have been reviewed.

Ethnobotanical studies have an interdisciplinary impact ranging from natural, medical-clinical and social sciences, reviewing not only the spiritual effects of plants but how to apply them to our benefit for health recovery.

Applying ethnobotanical surveys allows us to know how the clinician adopts traditional medicine for the benefit of patients either as a complement to allopathic medicine or even as the sole or main treatment.

The use of medicinal plants has a direct impact on one of the most important problems of our time, which is bacterial resistance to antimicrobials used today, and it should be noted that there are bacteria that are resistant to practically all antimicrobials, and this is not a problem that will disappear soon. Identifying the components that have antimicrobial activity against microorganisms associated with oral pathologies can help to provide alternatives or targets for the development of new pharmaceuticals.

Furthermore, knowing the anaesthetic or anti-inflammatory properties of these plants would allow us to use them locally in pathologies such as reversible pulpitis, improving the prognosis and treatment of various inflammatory pathologies of dental origin and even having a systemic impact, improving the patient's quality of life.

The problem to be solved in this research is to answer whether dental surgeons in the state of Guerrero use medicinal plants in their clinical practice for the treatment of oral diseases, and whether some of the socio-demographic characteristics of the dentists influence whether or not they prescribe medicinal plants, to know their doses and frequency of application; starting from the central hypothesis that clinical dentistry is supported by traditional medicine for the treatment of some oral diseases, which is why some dentists still use herbal medicine.

This chapter consists of the following sections:

3.2 Description of the method, where we will discuss the type of study and the design of the data collection instruments.

3.3 Results, where we present the results expressed in simple frequencies, a logistic regression analysis to see whether or not the socio-demographic characteristics of dental surgeons influence the prescription of medicinal plants, and tables showing in detail the use of plants, dosage, frequency and form of prescription.

3.4 Discussion, in which we contrast our results with those obtained by other authors in similar studies.

3.5 Conclusions, where we set out the main findings of the present work.

3.6 References.

3.2 Description of the method

A descriptive cross-sectional study was carried out between July 2021 and May 2022, using convenience sampling. 104 dentists from different localities in the state of Guerrero were interviewed with prior informed consent. A survey was designed to identify the use of medicinal plants, the part that is used and the pathology that is treated with these plants, as well as the demographic characteristics of the population. The main conditions of the oral cavity treated with plants, the form of application and frequency of treatments were also considered.

3.3 Results

A total of 104 dentists residing in the state of Guerrero, Mexico were interviewed, ranging in age from 24 to 65 years with a mean of 37 and SD + 8. Of these, 52% (54) were women and 48% (50) were men. The surveyed population resides in 20 different localities in the state, 51% (53) are from Acapulco, and 20% (21) from Chilpancingo. Graphic 3.1 shows the distribution of 80 localities, the participating dentists were grouped according to the region to which the locality of residence belongs, for this study Chilpancingo was considered independent because it is the capital of the state and an urban area, however individuals from Tixtla and Zumpango were interviewed, also belonging to the Central Zone; From the Costa Grande, places of residence included Papanoa, Zihuatanejo, Atoyac and San Luis la Loma; from the Costa Chica, San Marcos, Tlacochistlahuaca, Ometepec, Cuajinicuilapa, Cruz Grande and Copala; from the Zona Norte, Iguala and Taxco; and from the Montaña Alta, Chilapa and Metlatónoc.

Graphic 3.1 Place of residence
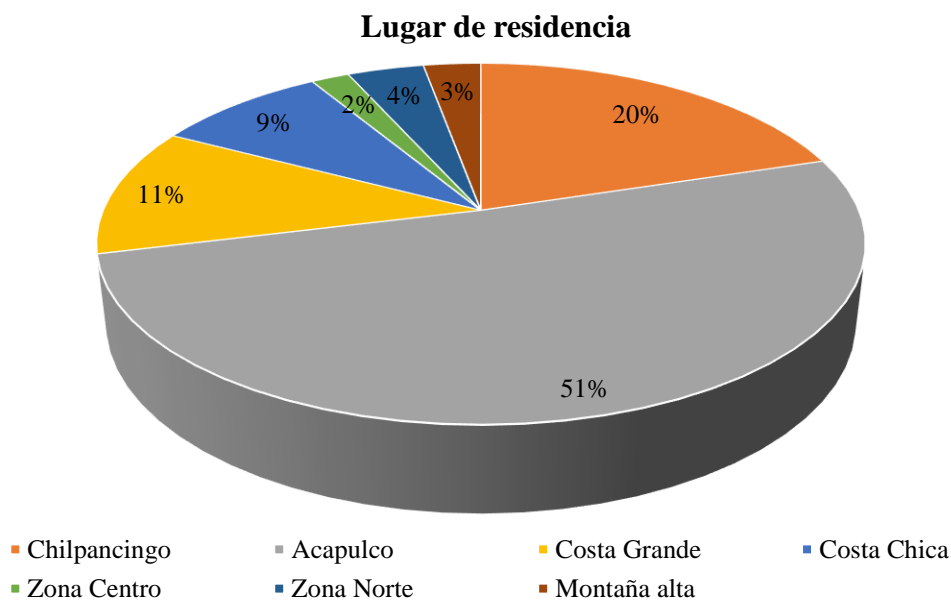
Source: Own elaboration

Table 3.1 shows the socio-demographic characteristics of the population studied, and an analysis of differences to determine whether the use of medicinal plants is influenced by age, gender, place of residence, the university where they studied, whether they work in the public or private sector or both; we can see that there are no differences between these variables and those who use medicinal plants or do not use them.

Table 3.1 Socio-demographic characteristics of the dentists interviewed classified by the use or non-use of medicinal plants in their dental practice. For age the median is shown (p25-p75), as there is no normal distribution the p-value was calculated by the Mann Whitney test, for the rest of the variables the number (n) and percentages (%) the p-value was calculated by the X^2 test

Characteristic		Total n=104 (100%)	Use plants n= 22 (21%)	Do not use plants n= 82 (79 %)	*p*-value
Age		36 (32-40)	37 (33-41)	35.5 (32-40)	0.5
Gender	Female	54 (52%)	12 (22.2%)	42 (77.8%)	0.7
	Male	50 (48%)	10 (20%)	40 (80%)	
Place of residence	Urban	74 (71%)	16 (21.6%)	58 (78.4%)	0.8
	Rural	30 (28%)	6 (20%)	24 (80%)	
University where you studied	Universidad Autónoma de Guerrero	82 (79%)	18 (22%)	64 (78%)	0.7
	Universidad Nacional Autónoma de México Benemérita	4 (4%)	1 (25%)	3 (75%)	
	Universidad Autónoma de Puebla	3 (3%)	1 (33.3%)	2 (66.7%)	
	Universidad Autónoma Metropolitana	3 (3%)	1 (33.3%)	2 (66.7%)	
	Others	12 (11%)	1 (8.3%)	11 (91.7%)	
Degree of studies	General Dentist	33 (31.7%)	7 (21.2%)	26 (78.8%)	0.9
	Diploma	10 (9.6%)	1 (10%)	9 (90%)	
	Speciality	43 (41.4%)	10 (23.3%)	33 (76.7%)	
	Master's degree	14 (13.5%)	3 (21.4%)	11 (78.6%)	
	Doctorate	4 (3.8%)	1 (25%)	3 (75%)	
	Periodontology	5 (8.2%)	0 (0)	5 (100%)	0.4
Area of specialisation	Endodontics	11 (18%)	2 (18.2%)	9 (81.8%)	
	Orthodontics	15 (24.6%)	6 (40%)	9 (60%)	
	Pathology	2 (3.3%)	0 (0%)	2 (100%)	
	Surgery	5 (8.2%)	1 (20%)	4 (80%)	
	Implantology	10 (16.4%)	3 (30%)	7 (70%)	
	Rehabilitation	3 (4.9%)	0 (0%)	3 (100%)	
	Paediatric dentistry	3 (4.9%)	0 (0%)	3 (100%)	
	Other	7 (11.4%)	1 (14.3%)	6 (85.7%)	
Sector of work	Public	14 (13.5%)	0 (0)	14 (00%)	0.1
	Private	65 (62.5%)	16 (24.6%)	49 (75.4%)	
	Both	25 (24%)	6 (24%)	19 (76%)	

Source: Own elaboration

Of the dentists interviewed, 21% (22) use medicinal plants in their clinical practice; a total of 22 species were identified, with cloves being the most used with 27% (6), followed by paulillo with 18% (4). Table 3.2 shows the distribution of plants used by the dentists, their scientific name, common name, the pathology they treat, the part of the plant they use and how they are used.

Table 3.2 Use of plants by dental surgeons in the state of Guerrero. It shows: scientific name of the plant, common name of the plant, pathology treated with the plant, part of the plant used, frequency of use of the plant, quantity of the plant used, state where the plant is used, number and percentage of dentists who use the plant

Scientific name	Common name	Use	Part used	Form of use	Frequency of use	Quantity	Status
Syzygium aromaticum	Clove	Pain, inflammation	Fruit, Seed	Infusion, powder, poultice, rinse, ointment	1 time, 2 times	Little, Slightly, Slightly, Medium	Dry
Rauvolfia tetraphylla	Daffodil	Periodontitis, Periodontal abscesses, Periodontal abscesses, Inflammation, Scarring	Leaves, Flowers, Stem, Peel or bark, Fruit	Infusion, rinse, decoction	2 times, 3 times	A little, Quite a lot, A lot	Fresh
Arnica montana	Arnica	Healing, Inflammation, Inflammation, Aphthous ulcers, pain	Leaves, Flowers	Infusion, rinse, decoction	2 times, 3 times	Quite a lot, Medium	Fresh, Dry
Chamaemelum nobile	Chamomile	Inflammation, Aphthous ulcers, Erosions on oral mucosa, Pain	Leaves, Flowers, Stem	Infusion, Rinse	3 times, 1 time	A little, Quite a lot	Fresh, Dry
Lavandula angustifolia	Lavender	Healing	Root	Infusion	1 time	A little	Fresh
Salvia rosmarinus	Rosemary	Periodontal abscesses	Leaves	Infusion, Rinse	1 time	Medium	Dry
Laurus nobilis	Laurel	Inflammation	Leaves	Rinse	3 times	Medium	Dry
Allium sativum	Garlic	Pain, Candidiasis, Periodontal disease	Fruit, Sap	Infusion, Juice, Powder, Ointment, Rinsing	1 time	A little	Fresh
Aloe vera	Aloe	Wounds, gingival erosions, Inflammation, Scarring	Sap, Stem	Poultice, Ointment, Ointment, Ointment, Juice	2 times	Fairly, Medium	Fresh
Amphipterygium adstringens	Quachalalate	Mobility, Periodontal Disease, Inflammation	Leaves, Bark	Infusion, Rinse	1 time, 3 times	A little	Fresh
Quercus xalapensis	Holm oak	Pain	Husk or Bark	Rinse, Infusion	2 times	Slight	Dry
Cannabis	Marijuana	Inflammation, Pain	Leaves	Infusion	1 time	A little	Dry
Cinnamomum verum	Cinnamon	Ulcers	Bark	Infusion, Rinse	1 time	Medium	Dry
Eysenhardtia polystachya	Palo azul	Healing	Leaves	Rinse	3 times	Medium	Fresh
Dracaena draco	Drago	Inflammation, Healing, Periodontal disease	Stem	Infusion, Rinse	2 times	Little, Medium	Dry, Fresh
Sesamum indicum	Sesame	Inflammation, Healing, Canker sores, Periodontal disease	Seed	Powder (Local)	4 times	Fairly	Dry
Citrus limon	Lemon	Inflammation, Canker sores	Fruit	Juice	1 time	Medium	Fresh
Rubus ulmifolius	Blackberry	Periodontal disease	Fruit	Juice	1 time	Medium	Freso
Dysphania ambrosioides	Epazote	Pain, Inflammation, Healing, Periodontal disease	Leaves	Infusion, Rinse	3 times	Slightly	Fresh
Mentha spicata	Peppermint	Halitosis, Pain	Leaves	Rinse	2 times	A little	Fresh
Thymus vulgaris	Thyme	Periodontal disease	Sap	Powder, ointment	2 times	Slightly	Dry

Source: Own elaboration

It was analyzed which oral pathologies are treated with medicinal plants, among which inflammation, healing and pain stand out. Graphic 3.2.

Graphic 3.2 Oral pathologies treated with medicinal plants. 14 of the medicinal plants were used to treat inflammation, 10 to treat scarring, 9 for pain, 4 for periodontal disease, 3 for canker sores and 2 for candidiasis

Oral diseases treated with medicinal plants
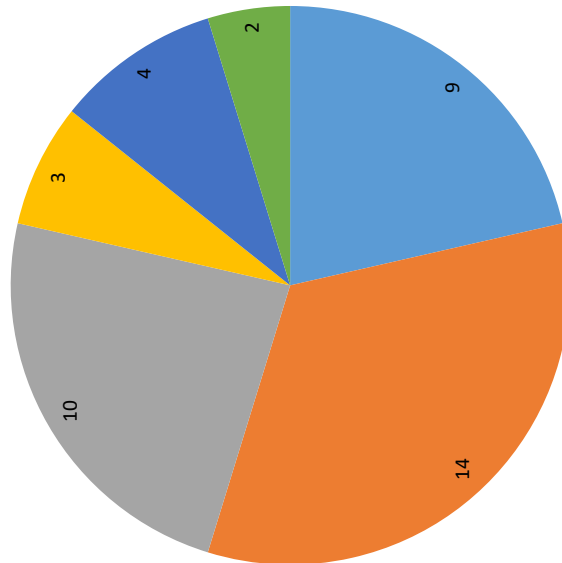
Source: Own elaboration

With regard to knowledge of the use of these plants, 77% of the dentists who used plants reported having obtained knowledge of the use of plants through local tradition, family members or the recommendation of a colleague; only 23% reported having obtained knowledge of the use of plants from the university, scientific articles or a course on herbal medicine in dentistry. They were also asked whether they had used the plant alone or in combination, of which 68% (15) used it alone and 32% (7) combined it with different substances, table 3.3.

Table 3.3 Substances with which plants are mixed for the treatment of oral pathologies

Substance	Frequency
Analgesic	1
Antibiotic	1
Anti-inflammatory	1
Alcohol	1
ZOE	1
Metronidazole	1
With another plant	2

Source: Own elaboration

Of the dentists who use plants in their clinical practice, 91% (20) use plants as an adjuvant, but 9% (2) use them as a treatment. Interestingly, although 21% of the dentists use plants, 54% (52) consider the use of medicinal plants to be justified.

3.4 Discussion

The use of herbal remedies has assumed a global dimension, culminating in their use in the treatment of various ailments in both developed and developing countries. However, only a few of these herbs have been approved for their medicinal properties, a vast majority of them in natural form. Kumar, G. (2013). It should not be overlooked that plants have been shown to have various metabolites with therapeutic activity, so much so that many of these are the main source (active ingredient) of various drugs.

In this study, 22 medicinal plants applied for dental use were identified, which are used alone or in combination with another plant or patent medicine, in which case the effect that the drug could provide should be considered. The use of plants in this study population is not only based on scientific evidence (articles), but mainly on traditions or advice from patients and relatives, so, although the use of plants seems to have a beneficial effect, it is recommended to review the scientific evidence to know both the beneficial and toxic effects of each of the recommended plants, as it is erroneously considered as a general belief that herbal medicines are benign and do not cause severe toxicity, however, the use of medicinal herbs can cause severe toxicity and even death. Kumar, G. (2013)

In this research it was found that the most used plants are cloves, this is different from what is reported by some authors such as Montoya (2011), which can be explained due to the region to which the interviewed professionals belong, However, several plants used coincide with those reported by Waizel-Bucay (2007) and Waizel-Bucay (2011), such as garlic and aloe vera; however, not all of them were reported for the same condition. D., (2020) in Mérida, Venezuela, obtaining similarities in plants such as garlic, aloe vera, chamomile, chamomile, mint, cloves, among others.

It is striking that almost a quarter of the dentists interviewed (21%) use medicinal plants, mostly based on empirical practices of traditional medicine, although there is scientific evidence of the benefits they provide. The diseases for which the dentists we interviewed used medicinal plants were: inflammation, healing, pain, periodontal disease, aphthous ulcers and candidiasis. (2006) who points out that medicinal plants are used in dentistry in two ways: one, through information from traditional medicine and the other, in the form of preparations such as toothpaste, topical paste, mouthwashes, mouthwashes for the treatment of gingivitis, aphthae, odontalgia, inflammatory processes, as fungicides and antibacterials.

3.5 Conclusions

21% of the dentists in the state of Guerrero who participated in the study use medicinal plants in their professional practice. The socio-demographic characteristics of the dentists showed no differences between the use or non-use of medicinal plants. In future similar research, we could increase the sample size to obtain more significant and conclusive results, as well as directing our efforts towards finding out the medicinal properties of the most commonly used plants.

3.6 Acknowledgements

3.7 Funding

3.8 References

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