Perception and use of herbal medicine in Hermosillo, Sonora (Northwest Mexico)

Percepción y uso de la medicina herbolaria en Hermosillo, Sonora (noroeste de México)

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ABSTRACT

Using herbal resources for medicinal purposes has persisted across diverse cultures, harnessing potential bioactivities. Despite the availability of commercial drugs, populations, including those in Mexico, continue to integrate herbal medicine into their healthcare practices. This study on Hermosillo, city in Northwest Mexico, explored the prevalence and patterns of herbal medicine use. A cross-sectional study was conducted from May to September 2023, surveying 441 residents through a structured questionnaire. Demographic characteristics, awareness, and experiences with herbal medicine were assessed. Most participants were female (67.57 %), age 30 years old or younger (67.57 %), and urban residents (90.70 %). The family was the primary source of knowledge for herbal medicine (73.92 %), emphasizing cultural continuity. Most participants (93.65 %) used herbal medicine when regarded as necessary, with 57.59 % reporting partial success. Despite reservations about safety (41.59 %), concurrent use with conventional treatments was common. The study underscores the persistent cultural connection to herbal medicine in families of Hermosillo. Awareness campaigns emphasizing responsible herbal medicine use, especially in vulnerable groups, are crucial. These findings contribute to a broader understanding of herbal medicine trends and practices, emphasizing the importance of local perspectives.
Keywords: herbal resources; alternative medicine; herbal knowledge.

RESUMEN

El uso de recursos herbolarios medicinales ha persistido en diversas culturas, aprovechando posibles bioactividades. A pesar de los medicamentos comerciales disponibles, las poblaciones, incluyendo México, siguen usando hierbas en cuidados de salud. Este estudio en Hermosillo, ciudad del noroeste de México, explora la prevalencia y uso de medicina herbolaria. Se realizó un estudio transversal de mayo a septiembre de 2023, encuestando a 441 residentes mediante cuestionarios estructurados. Se evaluaron características demográficas, conocimiento y experiencias con medicina herbolaria. La mayoría de los participantes fueron mujeres (68.56 %), menores de 30 años (67.12 %) y residentes urbanos (90.82 %). La familia fue la principal fuente de conocimientos sobre fitoterapia (73.7 %), destacando la continuidad cultural. El 93 % de los participantes utilizaron hierbas medicinales cuando lo consideraron necesario, y el 56.9 % informó éxito parcial. A pesar de las reservas sobre su seguridad (41.6 %), el uso simultáneo con tratamientos convencionales fue común (48.1 %). El estudio subraya la conexión cultural entre medicina herbolaria y familias mexicanas. Son necesarias campañas de sensibilización fomentando el uso responsable de medicinas herbolarias, especialmente en grupos vulnerables. Los hallazgos comparten una comprensión más amplia de tendencias y prácticas de la medicina herbolaria, enfatizando las perspectivas locales.
Palabras clave: recursos herbolarios; medicina alternativa; conocimientos herbolarios.

INTRODUCTION

Herbal resources have been used by humankind worldwide for years, often in undiscovered forms. Numerous plants contain metabolites with potential biological activities, including hepatoprotective, antitumor, antioxidant, and antimicrobial properties (Veiga *et al.*, 2008). In this regard, plants have traditionally been employed to treat or cure diseases (Armendáriz-Barragán *et al.*, 2016). Despite the availability of a wide array of commercial drugs, some communities continue to incorporate herbal medicine into their daily lives (Al Akeel *et al.*, 2018). It is estimated that the use of herbal medicine has increased over the last decade at specific regions worldwide, potentially influenced by regional cultural factors (Welz *et al.*, 2019).

Based on this, there have been comparisons regarding the use of traditional herbal medicine between different regions, such as China, and North American indigenous

communities like the Chumash, which has historically inhabited coastal areas of California (USA). Despite belonging to geographically distinct regions, these communities have similarities in the therapeutic use of plants (Adams *et al*., 2010).
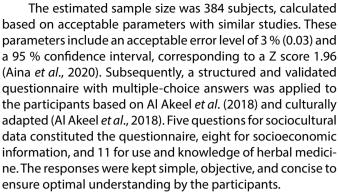
On the other hand, the use of medicinal plants in Mexico is an integral part of its culture, being the second country with the most registered medicinal plants (Rojas *et al*., 2022). In Central-Western Mexico, around 59.2 % of the population was estimated to use herbal resources to treat type 2 diabetes mellitus (Rodriguez-Fragoso *et al*., 2008; Ruiz-Noa *et al*., 2021). Similarly, an estimated 14.6 % of pregnant women residing in the central region of Mexico used herbal remedies (Alonso-Castro *et al*., 2018). Nevertheless, variations in practice and knowledge about herbal medicine may be region-dependent (Hopkins, 2011). Aligned with this perspective, in Mexico, some ethnic communities living at different areas and diverse environments, use plants from their surroundings to meet multiple needs, including their health improvement. Some of these practices are inherited generationally, and some persist, while others are forgotten (Cruz-Perez *et al*., 2021). Despite sharing Mexican traditions, cultural differences, particularly in the Northern part of the country, are due to factors such as its proximity to the United States and environmental conditions. However, the information about the frequency and practice of herbal medicine in each region of the country, specifically in the Northwest, is limited. This study aimed to survey the residents of Hermosillo, Sonora, in Northwest Mexico, to gain information about the use of herbal medicine, and its relationship with the sociodemographic characteristics of the population. Knowledge will be provided about the differences or similarities on the use of herbal medicine, to allow data comparisons among the different regions in the country and worldwide. Additionally, data associated with the practice of herbal medicine may help to elaborate regulations about the distribution and sale of herbal medicine in the country. This information will contribute to our understanding and analysis on the region's current use trends in herbal medicine, and to keep health professionals informed about this practice in Mexico.

MATERIAL AND METHODS

A cross-sectional study was conducted in the city of Hermosillo (29°04'30"N, 110°57'30"O), which has a population of 936,263 inhabitants (Ayuntamiento de Hermosillo, 2022). The study was carried out from May to September 2023. The inclusion criteria were adults of both sexes, aged over 18 years old, and residents of the municipality for at least two years. Furthermore, the Cochran formula was employed to calculate the minimum required sample size.

$$n = (z^2 * pq)/d^2$$

Where n = minimum sample size required in the study, z = Z score or standard deviations, p = proportion of people using herbal medicine in the study area and d = acceptable error level.

The estimated sample size was 384 subjects, calculated based on acceptable parameters with similar studies. These parameters include an acceptable error level of 3 % (0.03) and a 95 % confidence interval, corresponding to a Z score 1.96 (Aina *et al*., 2020). Subsequently, a structured and validated questionnaire with multiple-choice answers was applied to the participants based on Al Akeel *et al*. (2018) and culturally adapted (Al Akeel *et al*., 2018). Five questions for sociocultural data constituted the questionnaire, eight for socioeconomic information, and 11 for use and knowledge of herbal medicine. The responses were kept simple, objective, and concise to ensure optimal understanding by the participants.

Moreover, the socioeconomic level was determined using the AMAI rule 8 X 7, 2020, which has a scale that categorizes Mexican households into different socioeconomic segments, ranging from level A/B, which indicates the highest socioeconomic stratum, to level E, which reflects the lowest socioeconomic stratum (A/B, C+, C, C-, D+, D, and E). This classification was processed considering various factors, such as educational levels, occupation, possession of assets, and home dimensions. The distribution of questionnaires was conducted electronically through popular social media platforms such as X® (previously known as Twitter), Facebook®, and WhatsApp®. Google Forms® was employed for data collection, ensuring the participants' anonymity during the information-sharing process.

Descriptive statistics were used to interpret the data, and a chi-square test was carried out on the questions that did not allow more than one answer at a time, to find associations between the sociodemographic characteristics of the participants and their answers. All the statistical analyses were performed with the NCSS 2021 statistical package.

RESULTS AND DISCUSSION
Sociodemographic characteristics of the participants
The survey was conducted between July and September 2023, encompassing public spaces and academic institutions. A total of 441 individual agreed to participate. Regarding the demographic characteristics of the participants (Table 1), the majority were female (67.57 %), most participants were 30 years old or younger (67.57 %) and resided at urban areas (90.70 %). Regarding education, 51.94 % had completed university studies or attained a higher level of education, while the remainder had educational levels below this threshold. Additionally, the majority were employees (40.81 %) or students (34.92 %); therefore, they had a socioeconomic level of C.

Use and knowledge of herbal medicine
Regarding the responses provided by the survey participants (Table 2), 84.12 % affirm their awareness of, and experience with, herbal medicine. Notably, the primary source of knowledge about these alternatives is family, as 73.92 % of the participants reported. This is in agreement with previous findings indicating that even Mexican American residents continue to rely on traditional medicine within their family

Table 1. Sociodemographic data from the 441 participants of Hermosillo City (Northwest Mexico) from May to September 2023.
Tabla 1. Datos sociodemográficos de un total de 441 participantes de la ciudad de Hermosillo (noroeste de México) de mayo a septiembre de 2023.

Variables		n (%)
Sex	Female	298 (67.57)
	Male	143 (32.43)
Age (years)	≤30	298 (67.57)
	31-40	65 (14.73)
	≥40	78 (17.70)
Resident	Urban	400 (90.7)
	Rural	41 (9.3)
Education	Low level education	45 (10.20)
	High school	167 (37.86)
	University	190 (43.08)
	Postgraduate	30 (6.80)
	Other	9 (2.06)
Occupation	Unemployed	37 (8.39)
	Employed	180 (40.81)
	Health professional	18 (4.08)
	Administrative	15 (3.40)
	Student	154 (34.92)
	Other	37 (8.4)
†Socioeconomic level	A/B	34 (7.72)
	C+	111 (25.22)
	C	131 (29.77)
	C-	99 (22.5)
	D+	46 (10.45)
	D	19 (4.31)
	E	0 (0.0)

† Scale that categorizes Mexican households into different socio-economic segments, ranging from level A/B, which indicates the highest socioeconomic stratum, to level E, which reflects the lowest socioeconomic stratum (A/B, C+, C, C-, D+, D, and E).

networks (Lopez, 2005). Similarly, González-Stuart (2010) reported that from interviews with herbal medicine vendors in Monterrey, 42 % indicated that their understanding of this alternative medicine stemmed from family traditions or personal experiences. This suggested a persistent cultural connection to herbal medicine within Mexican families, displaying limited variation in the Northern region.

On the other hand, the country's southern region has also highlighted the family's significant influence on adopting these medicinal alternatives, mainly attributed to mothers (Cabada-Aguirre *et al*., 2023). This underscores the notion that Mexican communities predominantly preserve this cultural practice. Furthermore, reports from the La Rosita community at Puerto Colombia reveal that like Mexico, mothers take a lead role in traditional medicine usage, followed by grandmothers (Duque *et al*., 2018). However, this pattern may differ from experiences in other countries worldwide. For instance, a study conducted in Saudi Arabia indicated that most participants who used herbal remedies, did so based on recommendations from friends and neighbors (Al Akeel *et al*., 2018), highlighting behaviors that may not necessarily be replicated in other regions.

Furthermore, 93.65 % of the participants indicated they exclusively resort to this medicine when necessary. Of these, 57.59 % reported partial success with the treatment, while 36.96 % deemed it entirely successful. Only 5.44 % reported undesirable effects or inadequate relief from discomfort. Herbal medicine has demonstrated historical efficacy in treating and alleviating conditions such as allergies, arthritis, migraines, burns, and gastrointestinal discomfort. However, the effectiveness of herbal medicine can be influenced by the product's origin, and although currently national institutions such as CANIFARMA, COFEPRIS, Farmacopea de los Estados Unidos Mexicanos A.C., and the Federacion Nacional de la Industria Herbolaria, Medicina Alternativa, Tradicional y Naturista A.C., rules the herbal medicine, additional work is required to ensure the optimal distribution conditions and, to optimize their potential benefits (Guerrero-Encinas *et al*., 2023; Sam, 2019).

In addition, most respondents stated that they consumed unmixed, processed, or natural herbs or plants (50.02 %) and natural herbs or plants, while 35.82 % opted for commercial herbal products.

Additionally, a significant portion of participants (48.07 %) attributed their consumption of herbal remedies to family-inherited beliefs, and 36.50 % expressed a belief in the efficacy of these remedies. Presently, one of the primary motivations for using herbs in treating ailments is their natural origin and longstanding historical use by our ancestors. This inclination is reinforced by the perception that conventional medicine can occasionally lead to adverse effects on health (Elechi-Amadi *et al*., 2021). The industry has capitalized on this preference by investing in developing herbal medicine for commercial purposes. Reports indicate a substantial rise in the commercialization of herbal products for medicinal use, growing at a rate of 15 % annually, as per information from the World Bank (Gunjan *et al*., 2015). This information suggests that the commercialization of these products is emerging as a focal point for private initiatives fueled by a rising demand among the population.

On the other hand, 20.63 % of participants stated that they continue the use of herbal remedies even while undergoing conventional medical treatments, and 30.15 % suspend them occasionally. Furthermore, 41.59 % expressed a lack of belief in the safety of herbal medicine. In comparison, 27.66 % claimed uncertainty about its safety. Interestingly, despite the majority having reservations about the safety of herbal treatments, they tend to consume them concurrently with traditional medications. It is crucial to acknowledge that the combined effects of herbal medicine and allopathic medications may lead to antagonistic or, in some cases, synergistic effects that may not always be favorable. This concern is underscored by a study conducted on diabetic patients at the Jazan region of Saudi Arabia, where 33.7 % of participants reported the use of complementary and alternative medicine alongside modern medicine. Alarmingly, 67.4 % did not discuss their use of traditional remedies with their doctors, raising the possibility of either diminishing the

Table 2. Survey of use and knowledge of herbal medicine in 441 de participants of Hermosillo City (Northwest Mexico) from May to September 2023.

Tabla 2. Encuesta de uso y conocimiento de la medicina herbaria en 441 participantes de la ciudad de Hermosillo (noroeste de México) de mayo a septiembre de 2023.

Question and answer	n (%)	Question and answer	n (%)
1. Do you know about medicine-herbal remedies (use of plants, teas, tinctures, herbal extracts, essential oils, dietary supplements, creams, ointments), to treat or prevent ailments or diseases?		7. Why do you use herbal remedies as medicine?	
Yes	371 (84.12)	I think they are effective	161 (36.50)
No	70 (15.88)	I'm not sure	59 (13.37)
2. Have you used herbal medicine-remedies?		Beliefs (have been transmitted by family-friends)	212 (48.07)
Yes	370 (83.90)	Economy	9 (2.04)
No	71 (16.10)	8. When you take herbal remedies as medicine, do you avoid buying or taking conventional medications?	
3. How have you known about medicine-herbal remedies? (you can choose more than one answer)		Yes	91 (20.63)
TV	72 (16.32)	No	217 (49.20)
Internet	187 (42.40)	Occasionally	133 (30.15)
Friends	155 (35.14)	9. Do you think herbal remedies as medicine are safer than conventional medicine?	
Family	326 (73.92)	Yes	61 (13.83)
Health professionals	75 (17)	No	183 (41.59)
Other	49 (11.11)	I don't know	122 (27.66)
4. How often do you use them?		It does not matter to me	75 (17.00)
		10. Do you think that the information about herbal remedies used as medicine and published on commercial channels such as TV, radio, internet, social networks, can be reliable?	
Diary	19 (4.30)	Yes	132 (29.93)
Weekly	9 (2.04)	No	183 (41.49)
Only when necessary	413 (93.65)	It does not matter to me	126 (28.57)
5. How good was it to use the herbal remedy as medicine?		11. Have you used herbal remedies as medicine to treat your children?	
Successful	163 (36.96)	I don't have kids	291 (65.98)
Partially successful	254 (57.59)	I have never given them to them	49 (11.11)
Failed (Caused discomfort-did not relieve discomfort)	24 (5.44)	I have given them to them once	37 (8.39)
6. What type of herbal remedies have you used as medicine? (you can choose more than one answer)		I have given them to them more than once	64 (14.51)
Unmixed, processed, or natural herbs or plants	225 (50.02)		
Blend of known raw or natural herbs	145 (32.87)		
Unprocessed or natural unknown herb mix	16 (3.62)		
Commercial herbal products	158 (35.82)		
All the above	69 (15.64)		

intended effect, leading to hyperglycemia, or intensifying the effect, resulting in hypoglycemia (Meraya *et al*., 2022).

Furthermore, it has been evident that in Africa, a significant proportion of individuals, ranging from 12.4 to 77.1 %, concurrently consume both traditional and conventional medicine. Sometimes, healthcare providers may need to be aware of this dual consumption (Ekpor *et al*., 2023). Despite the benefits of phytotherapy, it is crucial to raise awareness among the population to encourage responsible use of these resources and prevent potential adverse effects, resulting from the current lack of comprehensive information about these treatments.

On the other hand, 41.49 % of respondents believe that the media's promotion of herbal medicine is unreliable, while 29.93 % express trust in it, and 28.57 % remain indifferent. Presently, there is a shift in public preferences, with doubts arising about the safety of conventional medicine. Consequently, individuals opt for herbal medicine due to its natural composition without synthetic chemical compounds. Exploiting these emerging opportunities, the industry markets products centered around plant extracts (Khayru and Issalillah, 2021). Nevertheless, regulations are imperative in overseeing the claims made by companies regarding these products. Many companies promise to alleviate a myriad of discomforts without substantial evidence, and these products often lack evaluations to substantiate the safety of their consumption (Ismail *et al*., 2018).

Finally, 65.98 % of the participants did not have children, but 22.90 % said they had given herbal treatment to their children once or more. A review carried out in the Latino population (from 1994 to 2013) indicated that most mothers perceive herbs as safe because they are natural, reporting their use to treat stomach pains, skin abrasions and dermatitis, constipation, and colic (Acorda *et al*., 2020). Additionally, a systematic review carried out in 2017, reported that over 66 % of children and adolescents who went to the doctor for gastrointestinal discomfort used complementary medicine, which included herbal medicine, and the parents surveyed thought that complementary medicine should also be considered by health professionals (Anheyer *et al*., 2017). The survey outcomes reveal a notable awareness and application of herbal medicine among participants, predominantly influenced by familial knowledge. This cultural connection to herbal remedies is consistent across diverse Mexican regions, highlighting the enduring impact of family traditions on healthcare decisions. Participants generally turn to herbal medicine when they perceive a need, reporting varying degrees of treatment success, with a small percentage noting undesirable effects. The choice among natural, processed, or commercial herbal products varies, reflecting a combination of family-inherited beliefs and general trust in the efficacy of these remedies. Concerns about the safety of herbal medicine, mainly when used alongside conventional treatments, emphasize the importance of heightened awareness and responsible use.

Relationship between sociodemographic characteristics and use and knowledge of herbal medicine

Regarding the data collected, an association was observed between knowing herbal medicine and being a woman (Table 3). The connection between women and their knowledge of herbal medicine (p = 0.0096) does not originate exclusively in a specific cultural context; somewhat, it is shaped by several factors that exhibit variations depending on the region and community under consideration. In specific cultural contexts, women have historically been assigned traditional roles focused on health care and household management. Within this framework, these women possess deep-rooted knowledge and practice using herbal remedies as an essential part of healthcare within the domestic setting (Boerma, 1995). On the other hand, some women may turn to herbal medicine to address specific health concerns, such as menstrual disorders and menopause, or even as a complement to prenatal and postnatal care (Magtalas *et al*., 2023).

On the other hand, an association was also found between being an urban resident and having used herbal medicine (p = 0.0043). In this context, this data is contradictory since rural communities, characterized by their close interaction with natural environments, frequently have direct access to various medicinal plants. This proximity to nature eases the acquisition of knowledge and the collection of herbs for medicinal purposes (Cordero *et al*., 2020). Likewise, herbal medicine has been transmitted from generation to

generation in many rural communities as part of their cultural tradition. People learn about the use of medicinal plants through observation and oral teaching contributing to the continuity of these practices (Ouma, 2022). Nevertheless, increasing knowledge about the relevance of natural health has resulted in increased integration of herbal medicine into urban settings. Furthermore, the marketing of natural products and herbalists by urban commercial establishments is increasing, and this may explain this association. In addition, inadvertently herbal resources can be consumed, since are widely employed across some domains, including food, agriculture, and chemistry. These natural raw materials are used to create healthy food products, enhance soil quality in organic farming, and develop chemical compounds for various industrial and pharmaceutical applications (Bolouri *et al*., 2022).

In addition, there is an association among using herbal medicine occasionally and being an urban resident (p = 0.0415) with a university level of education (p = 0.0001), and affirms that the results of this use were partially successful (Table 4). The association among the occasional use of herbal medicine, urban residence, and college education raises interesting considerations. The evaluation of the partial success of these treatments highlights the complexity of measuring health outcomes and the need for additional research to understand the determinants of this relationship.

Likewise, an association was found between using herbal medicine occasionally, being an urban resident, and a university level of education, and the affirmation that the results of its use were partially successful (p = 0.0262) (Table 4). The association between the occasional use of herbal medicine, urban residence, and college education raises exciting considerations. The evaluation of the partial success of these treatments highlights the complexity of measuring health outcomes and the need for additional research to understand the determinants of this relationship.

Another interesting fact was observing an association between having a university education level and using herbal medicine based on "beliefs" (p = 0.0011) (Table 5). Although a college education can offer access to scientific and technological information, cultural and family connections often still play a significant role in health choices. The intergenerational transmission of knowledge about herbal remedies can influence the health practices of people with university training, showing the persistence of family traditions in medicine (Nworu *et al*., 2015).

Besides, an association was found between respondents who did not believe in media propaganda regarding herbal medicine and respondents under 30 years of age (p = 0.0256), who had university studies (p = 0.0008), and were still students (p = 0.0016) (Table 6). Younger, more educated individuals are often more critical and exposed to various information sources. University training can foster essential evaluation skills, leading to greater distrust in advertising messages. Additionally, the preference for more natural approaches in healthcare may influence the perception of

Table 3. Relationship between sociodemographic characteristics and use and knowledge of herbal medicine question 1-2 in 441 participants.
Tabla 3. Relación entre características sociodemográficas y uso y conocimiento de la medicina herbolaria pregunta 1-2 en 441 participantes.

Variables	Q1			Q2		
	Yes	No	P	Yes	No	P
Sex						
Female	260 (58.96%)	38 (8.62%)	0.0096*	253 (57.37%)	45 (10.20%)	0.4099
Male	111 (25.17%)	32 (7.26%)		117 (26.53%)	26 (5.90%)	
Total	371 (84.13%)	70 (15.87%)		370 (83.90%)	71 (16.10%)	
Age						
≤30	251 (56.92%)	47 (10.66%)	0.9750	250 (56.69%)	48 (10.88%)	0.2877
31-40	55 (12.47%)	10 (2.27%)		58 (13.15%)	7 (1.59%)	
≥41	65 (14.74%)	13 (2.95%)		62 (14.06%)	16 (3.63%)	
Total	371 (84.13%)	70 (15.87%)		370 (83.90%)	71 (16.10%)	
Environment						
Rural	33 (7.48%)	8 (1.81%)	0.5031	28 (6.35%)	13 (2.95%)	**0.0043***
Urban	338 (76.64%)	62 (14.06%)		342 (77.55%)	58 (13.15%)	
Total	371 (84.13%)	70 (15.87%)		370 (83.90%)	71 (16.10%)	
Educational level						
Elementary	5 (1.13%)	0 (0.00%)	0.1129	5 (1.13%)	0 (0.00)	
Middle School	36 (7.16%)	4 (0.91%)		38 (8.62%)	2 (0.45%)	0.0252*
High School	132 (29.93%)	35 (7.94%)		129 (28.25%)	38 (8.62%)	
Bachelor´s Degree	166 (37.64%)	24 (5.44%)		163 (36.96%)	27 (6.12%)	
Postgraduate Degree	26 (5.90%)	4 (0.91%)		28 (6.35%)	2 (0.45%)	
Other	6 (1.36%)	3 (0.68%)		7 (1.59%)	2 (0.45%)	
Total	371 (84.13%)	70 (16.87%)		370 (83.90%)	71(16.10%)	
Occupation						
Unemployed	32 (7.26%)	5 (1.13%)	0.1976	34 (7.71%)	3 (0.68%)	0.6878
Employee	149 (33.79%)	31 (7.03%)		147 (33.33%)	33 (7.48%)	
Health professional	18 (4.08%)	0 (0.00%)		16 (3.63%)	2 (0.45%)	
Administrative	10 (2.27%)	5 (1.13%)		13 (2.95%)	2 (0.45%)	
Student	131 (29.71%)	23 (5.22%)		130 (29.48%)	24 (5.44%)	
Other	31 (7.03%)	6 (1.36%)		30 (6.80%)	7 (1.59%)	
Total	371 (84.13%)	70 (15.87%)		370 (83.90%)	71 (16.10%)	
†Socioeconomic level			0.2172			0.6015
A/B	28 (6.35%)	6 (1.36%)		32 (7.26%)	2 (0.45%)	
C+	96 (21.77%)	15 (3.40%)		90 (20.41%)	21 (4.76%)	
C	103 (23.36%)	28 (6.35%)		109 (24.72%)	22 (4.99%)	
C-	83 (18.82%)	16 (3.63%)		84 (19.05%)	15 (3.40%)	
D+	43 (9.75%)	3 (0.68%)		39 (8.84%)	7 (1.59%)	
D	18 (4.08%)	2 (0.45%)		16 (3.63%)	4 (0.91%)	
E	0 (0.00%)	0 (0.00%)		0 (0.00%)	0 (0.00%)	
Total	371 (84.13%)	70 (0.68%)		370	71	

† Scale that categorizes Mexican households into different socioeconomic segments, ranging from level A/B, which indicates the highest socioeconomic stratum, to level E, which reflects the lowest socioeconomic stratum (A/B, C+, C, C-, D+, D, and E). Q1; question 1, Q2; question 2. 2-sided Chi-square test, *Significant (p < 0.05).

herbal medicine, especially among those still immersed in academic settings. Even so, the influence of mass media on the use of herbal medicine is undeniable. Through various platforms such as television, internet, and social media, information is spread widely, shaping public perceptions and behaviors (Ng *et al*., 2023). Media coverage often highlights the perceived benefits of herbal medicine, leading to increased interest and adoption among consumers seeking alternative or complementary healthcare options.

Finally, it is worth to note the no association between the socioeconomic level and herbal medicine use and knowledge. Currently, herbal medicine is not conditioned by socioeconomic strata, evidencing a trend toward democratizing this practice in various communities. Unlike in the past, where specific natural health approaches might have been tied to certain economic levels, today, a broader and more diverse acceptance of herbal medicine is seen across all sectors of society (Kemppainen *et al*., 2018). On the another

Table 4. Relationship between sociodemographic characteristics and use and knowledge of herbal medicine question 4-5 by 441 participants.
Tabla 4. Relación entre características sociodemográficas y uso y conocimiento de la medicina herbolaria pregunta 4-5 en 441 participantes.

Variable	Q4				Q5			
	Diary	Weekly	Occasionally	P	Successful	Partially successful	Fail	P
Sex								
Female	17 (3.85%)	5 (1.13%)	276 (62.59%)		107 (24.26%)	175 (39.68%)	16 (3.63%)	
Male	2 (0.45%)	4 (0.91%)	137 (31.07%)	0.0882	56 (12.70%)	79 (32.43%)	8 (1.81%)	0.7830
Total	19 (4.31%)	9 (2.04%)	413 (93.65%)		163 (36.96%)	254 (57.60%)	24 (5.44%)	
Age								
≤30	13 (2.95%)	3 (0.68%)	282 (63.95%)		107 (24.26%)	174 (39.46%)	17 (3.85%)	
31-40	1 (0.23%)	3 (0.68%)	61 (13.83%)	0.1340	25 (5.67%)	35 (7.94%)	5 (1.13%)	0.6783
≥41	5 (1.13%)	3 (0.68%)	70 (15.87%)		31 (7.03%)	45 (10.20%)	2 (0.45%)	
Total	19 (4.31%)	9 (2.04%)	413 (93.65%)		163 (36.96%)	254 (57.60%)	24 (5.44%)	
Environment								
Rural	2 (0.45%)	3 (0.68%)	36 (8.16%)		14 (3.17%)	26 (5.90%)	1 (0.23%)	
Urban	17 (3.85%)	6 (1.36%)	377 (85.49%)	**0.0415***	149 (33.79%)	228 (51.70)	23 (5.22%)	0.5736
Total	19 (4.31%)	9 (2.04%)	413 (93.65%)		163 (36.96%)	254 (57.60%)	24 (5.44%)	
Educational level								
Elementary	1 (0.23%)	1 (0.23%)	3 (0.68%)		2 (0.45%)	3 (0.68%)	0 (0.00%)	
Middle School	5 (1.13%)	0 (0.00%)	35 (7.94%)		25 (5.67%)	13 (2.95%)	2 (0.45%)	
High School	2 (0.45%)	4 (0.91%)	161 (36.51%)	**0.0001***	59 (13.38%)	99 (22.45%)	9 (2.04%)	**0.0262***
Bachelor	8 (1.81%)	1 (0.23%)	181 (41.04%)		57 (12.93%)	122 (27.66%)	11 (2.49%)	
Postgraduate	2 (0.45%)	3 (0.68%)	25 (5.67%)		16 (3.63%)	13 (2.95%)	1 (0.23%)	
Other	1 (0.23%)	0 (0.00%)	8 (1.81%)		4 (0.91%)	4 (0.91%)	1 (0.23%)	
Total	19 (4.31%)	9 (2.04%)	431 (93.65%)		163 (36.96%)	254 (57.60%)	24 (5.44%)	
Occupation								
Unemployed	1 (0.23%)	2 (0.45%)	34 (7.71%)		16 (3.63%)	17 (3.85%)	4 (0.91%)	
Employee	8 (1.81%)	5 (1.13%)	167 (37.87%)		67 (15.19%)	104 (23.58%)	9 (2.04%)	
Health professional	2 (0.45%)	0 (0.00%)	16 (3.63%)		7 (1.59%)	11 (2.49%)	0 (0.00%)	
Administrative	0 (0.00%)	0 (0.00%)	15 (3.40%)	0.0755	2 (0.45%)	12 (2.72%)	1 (0.23%)	0.1985
Student	3 (0.68%)	2 (0.45%)	149 (33.79%)		52 (11.79%)	95 (21.54%)	7 (1.59%)	
Other	5 (1.13%)	0 (0.00%)	32 (7.26%)		19 (4.31%)	15 (3.40%)	3 (0.68%)	
Total	19 (4.31%)	9 (2.04%)	413 (93.65%)		163 (36.96%)	254 (57.60%)	24 (5.44%)	
†Socioeconomic level								
A/B	2 (0.45%)	0 (0.00%)	32 (7.26%)		12 (2.72%)	22 (4.99%)	0 (0.00%)	
C+	5 (1.13%)	4 (0.91%)	102 (23.13%)		45 (10.20%)	59 (13.38%)	7 (1.59%)	
C	6 (1.36%)	4 (0.91%)	121 (27.44%)		41 (9.30%)	85 (19.27%)	5 (1.13%)	
C-	3 (0.68%)	0 (0.00%)	96 (21.77%)	0.5640	42 (9.52%)	52 (11.79%)	5 (1.13%)	0.0936
D+	3 (0.68%)	0 (0.00%)	43 (9.75%)		19 (4.31%)	21 (4.76%)	6 (1.36%)	
D	0 (0.00%)	1 (0.23%)	19 (4.31%)		4 (0.91%)	15 (3.40%)	1 (0.13%)	
E	0 (0.00%)	0 (0.00%)	0 (0.00%)		0 (0.00%)	0 (0.00%)	0 (0.00%)	
Total	19 (4.31%)	9 (2.045)	413 (93.65%)		163 (36.96%)	254 (57.60%)	24 (5.44%)	

† Scale that categorizes Mexican households into different socioeconomic segments, ranging from level A/B, which indicates the highest socioeconomic stratum, to level E, which reflects the lowest socioeconomic stratum (A/B, C+, C, C-, D+, D, and E). Q4; question 4, Q5; question 5. 2-sided Chi-square test, *Significant ($p < 0.05$).

hand, although wealthy people have access to high-priced products that promise to be more effective, current government institutions have not been able to fully regulate the process of these products, increasing the risk of accessing to unexpected less effective items (Balekundri and Mannur, 2020). People from different socioeconomic backgrounds are turning to herbal medicine to address various health needs, reflecting a shift toward a more accessible appreciation of natural care methods. This phenomenon suggests that herbal medicine has surpassed economic barriers and has become a treatment option appreciated for its accessibility and comprehensive approach to well-being. On another hand, most of participants reported that they did not have children, observing an association between this and being a student, and/or having high school as level of education (Table 7). For this reason, no association was found between

sociodemographic characteristics and administering herbal medicine to their children.

In herbal medicine, it is strongly recommended to consult a healthcare professional before starting its administration. Thorough research on herbs, their proper dosage, and possible interactions, are essential for safe application. Informing health professionals about herbal medicine usage, purchasing quality products, and being aware of potential adverse reactions are crucial practices. Furthermore, it is emphasized that herbal medicine should not replace conventional medical treatments, and that variety in the diet, including herbs and medicinal foods, can be a balanced way to take advantage of its benefits. These recommendations are significant for vulnerable groups such as pregnant women, older people, and those with preexisting medical conditions.

Table 5. Relationship between sociodemographic characteristics and use and knowledge of herbal medicine question 7-8 by 441 participants.

Tabla 5. Relación entre características sociodemográficas y uso y conocimiento de la medicina herbolaria pregunta 7-8 en 441 participantes.

Variable	Q7					Q8			
	Effective	Beliefs	Economic	Not sure	P	Yes	No	Occasionally	P
Sex									
Female	110 (24.94%)	147 (33.33%)	4 (0.91%)	37 (8.39%)		60 (13.61%)	145 (32.88%)	93 (21.09%)	
Male	51 (11.56%)	65 (14.74%)	5 (1.13%)	22 (4.99%)	0.3652	31 (7.03%)	72 (16.33%)	40 (9.07%)	0.7775
Total	161 (36.51%)	212 (48.07%)	9 (2.04%)	59 (13.38%)		91 (20.63%)	217 (49.21%)	133 (30.16%)	
Age									
≤30	104 (23.58%)	146 (33.11%)	3 (0.68%)	45 (10.20%)		61 (13.83%)	154 (34.92%)	83 (18.82%)	
31-40	23 (5.22%)	33 (7.48%)	3 (0.68%)	6 (1.36%)	0.1748	11 (2.49%)	30 (6.80%)	24 (5.44%)	0.4084
≥41	34 (7.71%)	33 (7.48%)	3 (0.68%)	8 (1.81%)		19 (4.31%)	33 (7.48%)	26 (5.90%)	
Total	161 (36.51%)	212 (48.07%)	9 (2.04%)	59 (13.38%)		91 (20.63%)	217 (49.21%)	133 (30.16%)	
Environment									
Rural	15 (3.40%)	16 (3.63%)	3 (0.68%)	7 (1.59%)		11 (2.49%)	17 (3.85%)	13 (2.95%)	
Urban	146 (33.11%)	196 (44.44%)	6 (1.36%)	52 (11.79%)	0.0603	80 (18.14%)	200 (45.35%)	120 (27.21%)	0.4899
Total	161 (36.51%)	212 (48.07%)	9 (2.04%)	59 (13.38%)		91 (20.63%)	217 (49.21%)	133 (30.16%)	
Educational level									
Elementary	2 (0.45%)	3 (0.68%)	0 (0.00%)	0 (0.00%)		2 (0.45%)	3 (0.68%)	0 (0.00%)	
Middle School	28 (6.35%)	10 (2.27%)	0 (0.00%)	2 (0.45%)		13 (2.95%)	17 (3.85%)	10 (2.27%)	
High School	52 (11.79%)	12 (17.91%)	4 (0.91%)	32 (7.26%)		37 (8.39%)	73 (16.55%)	57 (12.93%)	
Bachelor	63 (14.29%)	103 (23.36%)	5 (1.13%)	19 (4.31%)	0.0011*	31 (7.03%)	104 (23.58%)	55 (12.47%)	0.2266
Postgraduate	15 (3.40%)	12 (2.72%)	0 (0.00%)	3 (0.68%)		6 (1.36%)	17 (3.85%)	7 (1.59%)	
Other	1 (0.23%)	5 (1.13%)	0 (0.00%)	3 (0.68%)		2 (0.45%)	3 (0.68%)	4 (0.91%)	
Total	161 (36.51%)	212 (48.07%)	9 (2.04%)	59 (13.38%)		91 (20.63%)	217 (49.21%)	133 (30.16%)	
Occupation									
Unemployed	18 (4.08%)	16 (3.36%)	0 (0.00%)	3 (0.68%)		8 (1.81%)	20 (4.54%)	9 (2.04%)	
Employee	68 (15.42%)	88 (19.95%)	3 (0.68%)	21 (4.76%)		35 (7.94%)	86 (19.50%)	59 (13.38%)	
HP	7 (1.59%)	10 (2.27%)	0 (0.00%)	1 (0.23%)		5 (1.13%)	11 (2.49%)	2 (0.45%)	
Administrative	6 (1.36%)	5 (1.13%)	1 (0.23%)	3 (0.68%)	0.5370	5 (1.13%)	7 (1.59%)	3 (0.68%)	0.7475
Student	46 (10.43%)	80 (18.14%)	4 (0.91%)	24 (5.44%)		29 (6.58%)	76 (17.23%)	49 (11.11%)	
Other	16 (3.36%)	13 (2.95%)	1 (0.23%)	7 (1.59%)		9 (2.04%)	17 (3.85%)	11 (2.49%)	
Total	161 (36.51%)	212 (48.07%)	9 (2.04%)	59 (13.38%)		91 (20.63%)	217 (49.21%)	133 (30.16%)	
†Socioeconomic level									
A/B	11 (2.49%)	20 (4.54%)	1 (0.23%)	2 (0.45%)		11 (2.49%)	15 (3.40%)	8 (1.81%)	
C+	33 (7.48%)	58 (13.15%)	2 (0.45%)	18 (4.08%)		21 (4.76%)	54 (12.24%)	36 (8.16%)	
C	54 (12.24%)	56 (12.70%)	3 (0.68%)	18 (4.08%)		27 (6.12%)	62 (14.06%)	42 (9.52%)	
C-	38 (8.62%)	48 (10.88%)	3 (0.68%)	10 (2.27%)	0.6860	23 (5.22%)	53 (12.02%)	23 (5.22%)	0.3868
D+	15 (3.40%)	23 (5.22%)	0 (0.00%)	8 (1.81%)		4 (0.91%)	25 (5.67%)	17 (3.85%)	
D	10 (2.27%)	7 (1.59%)	0 (0.00%)	3 (0.68%)		5 (1.13%)	8 (1.81%)	7 (1.59%)	
E	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)		0 (0.00%)	0 (0.00%)	0 (0.00%)	
Total	161 (36.51%)	212 (48.07%)	9 (2.04%)	59 (13.38%)		91 (20.63%)	217 (49.21%)	133 (30.16%)	

† Scale that categorizes Mexican households into different socioeconomic segments, ranging from level A/B, which indicates the highest socioeconomic stratum, to level E, which reflects the lowest socioeconomic stratum (A/B, C+, C, C-, D+, D, and E). Q7; question 7, Q8; question 8. 2-sided Chi-square test, *Significant ($p < 0.05$).

Table 6. Relationship between sociodemographic characteristics and use and knowledge of herbal medicine question 9-10 by 441 participants.
Tabla 6. Relación entre características sociodemográficas y uso y conocimiento de la medicina herbolaria pregunta 9-10 en 441 participantes.

Variable	Q9					Q10			
	Yes	No	I don't know	Indifferent	P	Yes	No	Indifferent	P
Sex									
Female	41 (9.30%)	131 (29.71%)	74 (16.78%)	52 (11.79%)		82 (18.59%)	130 (29.48%)	86 (19.50%)	
Male	20 (4.54%)	52 (11.79%)	48 (10.88%)	23 (5.22%)	0.2490	52 (11.34%)	53 (12.02%)	40 (9.07%)	0.2441
Total	61 (13.83%)	183 (41.50%)	122 (27.66%)	75 (17.01%)		132 (29.93%)	183 (41.50%)	126 (28.57%)	
Age									
≤30	36 (8.16%)	133 (30.16%)	76 (17.23%)	53 (12.02%)		75 (17.01%)	132 (29.93%)	91 (20.63%)	
31-40	8 (1.81%)	28 (6.35%)	20 (4.54%)	9 (2.04%)	0.1037	23 (5.22%)	25 (5.67%)	17 (3.85%)	**0.0256***
≥41	17 (3.85%)	22 (4.99%)	26 (5.90%)	13 (2.95%)		34 (7.71%)	26 (5.90%)	18 (4.08%)	
Total	61 (13.83%)	183 (41.50%)	122 (27.66%)	75 (17.01%)		132 (29.93%)	183 (41.50%)	126 (28.57%)	
Environment									
Rural	9 (2.04%)	9 (2.04%)	17 (3.85%)	6 (1.35%)		20 (9.30%)	9 (2.04%)	12 (2.72%)	
Urban	52 (11.79%)	174 (39.46%)	105 (23.81%)	69 (15.65%)	**0.0225***	112 (25.40%)	174 (39.46%)	114 (25.85%)	**0.0085***
Total	61 (13.83%)	183 (41.50%)	122 (27.66%)	75 (17.01%)		132 (29.93%)	183 (41.50%)	126 (28.57%)	
Educational level									
Elementary	2 (0.45%)	0 (0.00%)	3 (0.68%)	0 (0.00%)		4 (0.91%)	1 (0.23%)	0 (0.00%)	
Middle School	11 (2.49%)	5 (3.40%)	9 (2.04%)	5 (1.13%)		21 (4.76%)	12 (2.72%)	7 (1.59%)	
High School	19 (4.31%)	66 (14.97%)	52 (11.79%)	30 (6.80%)		43 (9.75%)	67 (15.19%)	57 (12.93%)	
Bachelor	25 (5.67%)	85 (19.27%)	49 (11.11%)	31 (7.03%)	0.2218	48 (10.88%)	85 (19.27%)	57 (12.93%)	**0.0008***
Postgraduate	3 (0.68%)	14 (3.17%)	7 (1.59%)	6 (1.36%)		10 (2.27%)	16 (3.63%)	4 (0.91%)	
Other	1 (0.23%)	3 (0.68%)	2 (0.45%)	3 (0.68%)		6 (1.36%)	2 (0.45%)	1 (0.23%)	
Total	61 (13.83%)	183 (41.50%)	122 (27.66%)	75 (17.01%)		132 (29.93%)	183 (41.50%)	126 (28.57%)	
Occupation									
Unemployed	4 (0.91%)	17 (3.85%)	12 (2.72%)	4 (0.91%)		16 (3.63%)	15 (3.40%)	6 (1.36%)	
Employee	27 (6.12%)	64 (14.51%)	54 (12.24%)	35 (7.94%)		59 (13.38%)	71 (16.10%)	50 (11.34%)	
Health professional	2 (0.45%)	9 (2.04%)	3 (0.68%)	4 (0.91%)		2 (0.45%)	9 (2.04%)	7 (1.59%)	
Administrative	1 (0.23%)	5 (1.13%)	6 (1.36%)	3 (0.68%)	0.5700	6 (1.36%)	6 (1.36%)	3 (0.68%)	**0.0016***
Student	19 (4.31%)	73 (16.55%)	36 (8.16%)	26 (5.90%)		29 (6.58%)	72 (16.33%)	53 (12.02%)	
Other	8 (1.81%)	15 (3.40%)	11 (2.49%)	3 (0.68%)		20 (4.54%)	10 (2.27%)	7 (1.59%)	
Total	61 (13.83%)	183 (41.50%)	122 (27.66%)	75 (17.01%)		132 (29.93%)	183 (41.50%)	126 (28.57%)	
†**Socioeconomic level**									
A/B	5 (1.13%)	15 (3.40%)	6 (1.36%)	8 (1.81%)		9 (2.04%)	16 (3.63%)	9 (2.04%)	
C+	15 (3.40%)	44 (9.98%)	38 (8.62%)	14 (3.17%)		30 (6.80%)	51 (11.56%)	30 (6.80%)	
C	16 (3.63%)	63 (14.29%)	34 (7.71%)	18 (4.08%)		40 (9.07%)	53 (12.02%)	38 (8.62%)	
C-	18 (4.08%)	38 (8.62%)	24 (5.44%)	19 (4.31%)	0.2325	33 (7.48%)	34 (7.71%)	32 (7.26%)	0.9296
D+	3 (0.68%)	14 (3.17%)	16 (3.36%)	13 (2.95%)		13 (2.95%)	20 (4.54%)	13 (2.95%)	
D	4 (0.91%)	9 (2.04%)	4 (0.91%)	3 (0.68%)		7 (1.59%)	9 (2.04%)	4 (0.91%)	
E	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)		0 (0.00%)	0 (0.00%)	0 (0.00%)	
Total	61 (13.83%)	183 (41.50%)	122 (27.66%)	75 (17.01%)		132 (29.93%)	183 (41.50%)	126 (28.57%)	

† Scale that categorizes Mexican households into different socioeconomic segments, ranging from level A/B, which indicates the highest socioeconomic stratum, to level E, which reflects the lowest socioeconomic stratum (A/B, C+, C, C-, D+, D, and E). Q9; question 9, Q10; question 10. 2-sided Chi-square test, *Significant (p < 0.05).

Table 7. Relationship between sociodemographic characteristics and use and knowledge of herbal medicine question 11 by 441 participants.
Tabla 7. Relación entre características sociodemográficas y uso y conocimiento de la medicina herbolaria pregunta 11 en 441 participantes.

Variable	Q11				
	Once	+Once	No	No children	P
Sex					
Female	29 (6.58%)	43 (9.47%)	36 (8.16%)	190 (43.08%)	
Male	8 (1.81%)	21 (4.76%)	13 (2.95%)	101 (22.90%)	0.3281
Total	37 (8.39%)	64 (14.51%)	49 (11.11%)	291 (65.99%)	
Age					
≤30	23 (5.22%)	36 (8.16%)	36 (8.16%)	203 (46.03%)	
31-40	5 (1.13%)	10 (2.27%)	10 (2.27%)	40 (9.07%)	0.0626
≥41	9 (2.04%)	18 (4.08%)	3 (0.68%)	48 (10.88%)	
Total	37 (8.39%)	64 (14.51%)	49 (11.11%)	291 (65.99%)	
Environment					
Rural	0 (0.00%)	7 (1.59%)	5 (1.13%)	29 (6.58%)	
Urban	37 (8.39%)	57 (12.93%)	44 (9.98%)	262 (59.41%)	0.2408
Total	37 (8.39%)	64 (14.51%)	49 (11.11%)	291 (65.99%)	
Educational level					
Elementary	1 (0.23%)	3 (0.68%)	0 (0.00%)	1 (0.23%)	
Middle School	9 (2.04%)	13 (2.95%)	4 (0.91%)	14 (3.17%)	
High School	7 (1.59%)	21 (4.76%)	19 (4.31%)	120 (27.21%)	
Bachelor	18 (4.08%)	18 (4.08%)	18 (4.08%)	136 (30.84%)	**0.0000***
Postgraduate	1 (0.23%)	6 (1.36%)	7 (1.59%)	16 (3.63%)	
Other	1 (0.23%)	3 (0.68%)	1 (0.23%)	4 (0.91%)	
Total	37 (8.39%)	64 (14.51%)	49 (11.11%)	291 (65.99%)	
Occupation					
Unemployed	5 (1.13%)	10 (2.27%)	5 (1.13%)	17 (3.85%)	
Employee	19 (4.31%)	31 (7.03%)	22 (4.99%)	108 (24.49%)	
Health professional	4 (0.91%)	5 (1.13%)	3 (0.68%)	6 (1.36%)	
Administrative	1 (0.23%)	2 (0.45%)	1 (0.23%)	11 (2.49%)	**0.0000***
Student	1 (0.23%)	5 (1.13%)	7 (1.59%)	141 (31.97%)	
Other	7 (1.59%)	11 (2.49%)	11 (2.49%)	8 (1.81%)	
Total	37 (8.39%)	64 (14.51%)	49 (11.11%)	291 (65.99%)	
†**Socioeconomic level**					
A/B	3 (0.68%)	8 (1.81%)	5 (1.13%)	18 (4.08%)	
C+	8 (1.18%)	16 (3.63%)	16 (3.63%)	71 (16.10%)	
C	10 (2.27%)	15 (3.40%)	16 (3.63%)	90 (20.41%)	
C-	9 (2.04%)	18 (4.08%)	8 (1.81%)	64 (14.51%)	
D+	2 (0.45%)	4 (0.91%)	3 (0.68%)	37 (8.39%)	0.1924
D	5 (1.13%)	3 (0.68%)	1 (0.23%)	11 (2.49%)	
E	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	
Total	37 (8.39%)	64 (14.51%)	49 (11.11%)	291 (65.99%)	

† Scale that categorizes Mexican households into different socioeconomic segments, ranging from level A/B, which indicates the highest socioeconomic stratum, to level E, which reflects the lowest socioeconomic stratum (A/B, C+, C, C-, D+, D, and E). Q11; question 11. 2-sided Chi-square test, *Significant ($p < 0.05$).

CONCLUSIONS

Our findings reveal the persistence of intergenerational solid and cultural ties that significantly influence adopting herbal practice despite the educational level achieved. The widespread awareness and positive perception of herbal medicine underline its roots in the daily lives of Mexican families. Sociodemographic characteristics such as gender, urban residence, and education level, among others described above, are associated with the knowledge and usage of herbal medicine, highlighting the complex interplay among cultural, social, and educational factors in shaping health practices. This may reflect similarities between the Northwest region, specifically the city of Hermosillo, and what is reported in other areas. However, measures are still necessary to promote the safe use of these treatments. The need for clear and compelling regulations in this area is highlighted. Furthermore, the relevance of addressing these issues stands out from a local perspective, the culture and social particularities that shape the relationship between the population and herbal medicine.

ACKNOWLEDGMENTS

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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