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Prevalence, Perception, and Use of Herbal Remedies among the Geriatric Population in Karbala

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Abstract. Globally, there has been an upsurge in the use of herbal remedies among populations in different countries. Few studies have been performed to detect the use and risk of herbal remedies in the senior community, especially given the high frequency of chronic diseases. Thus, this work aimed to uncover the frequency of herbal medicine consumption among the geriatric population in Karbala and the possible impact of herbal medicine on their health and current medical history. This study was carried out in a cross-sectional design between October 2023 and June 2024, using a pretested questionnaire administered to elderly patients aged ≥60 residing in Karbala. Participants engaged in in-person sessions and responded to a comprehensive questionnaire consisting of 20 closed-ended questions. The data gathered were assessed using a statistical package for social sciences; Pearson's R was used to correlate some variables, and P-values > 0.05 were considered significant. Four hundred and ten patients from home care and hospitals in Karbala joined this survey. 64.4% of participants were aged 64-75, and 51.7% were male, compared to 48.3% of females. Data showed no significant differences between gender, income, and education. Most participants (84.4%) had chronic disease, and 60 % of them were prescribed more than two medications to control these disorders. Results showed that 51.22% of patients used herbs, and 24.8% believed the herbs were utterly devoid of side effects. 73.7% of patients reported not disclosing their use of herbs to their physicians, and 76.1% were not aware of possible drug-herbal interaction. The study also revealed that elderly patients in the studied area used about twenty-one different herbal remedies, with seven having the highest rate of use: Cinnamon (11.4%), Chamomile (11.0%), Anise (10.0%), Borage (7.6%), Garlic (7.1%), Ginko (6.2%), and Ginger (5.7%). The study concluded that elderly patients highly use herbal remedies regardless of gender, income, and education. This use imposes the risk of drug-herbal interaction as patients do not disclose herbal use to their healthcare professionals, and they are not aware of possible dangers.

Keywords: Herbal Medicine, Prevalence; Drug-herbal interactions; Senior Patients, Patient Safety.

INTRODUCTION

The global utilization of herbal remedies has witnessed a significant rise as many consumers increasingly employ these remedies to manage various health issues in healthcare systems throughout diverse nations [1]. The public utilizes herbal medicine to address many healthcare requirements, including disease prevention and the management of chronic ailments such as dyslipidemia, hypertension, diabetes, cancer, and inflammatory bowel diseases [2,3]. Prior studies have shown different prevalences of herbal consumption in the senior community, ranging from 12.0%–to 97.4% depending on the study population and setting [4-6]. This utilization is also prevalent among the Iraqi populace, with a comparable percentage of use, owing to a favorable disposition and awareness of herbal medicines passed down from generation to generation [7]. Herbal medications can be provided without obligatory safety and efficacy profiles for pharmaceutical drugs. Some herbal remedies, such as ginkgo, have scientific data supporting their effectiveness in managing dementia, and other herbal medicines have been linked to adverse side effects [8]. The active elements of the constituent herbs might produce adverse medication events, such as nephrotoxicity, hepatotoxicity, or carcinogenicity [9]. Impurities in herbal medicines, such as heavy metals, can also contribute to these events [10]. Additionally, combinations of herbal and conventional drugs can lead to adverse effects [11]. Geriatric patients are

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more vulnerable to these adverse incidents due to their lowered physical capacity, increased frequency of health conditions, and higher drug consumption. Most people lack awareness regarding the issue of drug interactions, which impose severe effects on patients' health [12]. Typically, those who are aged sixty years and older take two to three prescribed medications on a daily basis. However, this number tends to climb for those over eighty years old, with more than five medications being taken daily [13]. Some studies revised the simultaneous use of prescription medication and herbal remedies among geriatrics and possible risks [14,15]. Limited studies were performed in Iraq demonstrating the use of the senior community herbal products and their potential interaction with the prescribed medication. Thus, this study aimed to determine the prevalence of herbal medicine usage among the geriatric population in Karbala and the associated factors for this use, shedding light on the possible risks and drug-herbal interaction related to this use.

MATERIALS AND METHODS

Study Design

A cross-sectional survey was implemented on the geriatric population residing in Karbala. The survey was performed between October 2023 and June 2024. A thorough questionnaire was prepared and discussed with elderly patients aged ≥60 years who attended Karbala Home Care, Imam Al-Hujjah Hospital, Al-Hussein Medical City, and Turkish Hospital. Age groups for elderly patients were grouped according to Lee's study into three categories: patients aged 65-74 years, patients aged 75- 84 years, and the third group of patients aged ≥ 85 years [16].

The inclusion criteria were based on age, residence, and participation acceptance. In contrast, the exclusion criteria were incomplete forms.

Data Collection

Patients were personally interviewed, with each session lasting between 15 and 25 minutes. By agreeing to participate in this survey, patients consented, and the study obtained ethical approval from Al Zahrawi University College's ethical board. (REBZ Ref No 1/10/23)**.** The formula used to determine the minimum sample size was as follows [17].

$$n = (Z1 - \alpha)2 \times P(1 - P)/d2 \qquad \text{i)}$$

- n = number to sample.
- $Z_{1-\alpha}$ is a normal standard variation (at $p<0.05 = 1.96$),
- P= the expected prevalence. In this research, P was set to 33.3 % (18), the excepted proportion of the population utilizing herbal supplements in adults, depending on previous studies.
- d is the maximum tolerable error for the prevalence estimate (e.g., ±0.05)

Inquiry Form

The survey questionnaire was formulated through a complete analysis of relevant literature sources **[17-19],** with necessary adjustments made to align with the study's objectives. Three pharmacy professionals assessed the questionnaire form's content validity. This form was pilot-tested on a sample of five patients to evaluate the understanding, application, and viability of the pool of items. Based on the comments made, it was amended. The final form was retested again on another five sample patients. The form consisted of 20 closed-ended questions organized into five distinct sections. Cronbach's Alpha for the questionnaire was 0.738.

The first section (A) asked nine questions to assess participants' characteristics. It identified patient residence (home care or hospital), gender, age, the highest level of education, income, underlying disease, number of underlying diseases, type of chronic disease, and current regular medication. The second section (B), with its seven questions, discussed the Prevalence, Use, and Perception of herbal remedies. Section (C) included one question with a multiple-choice answer to address the factors contributing to the use of herbal medicine. The fourth section (D) considered the person who recommended herbal remedies to the patients. The last section, (E), describes the herbal remedies, mentioning the names and uses of these herbs.

Statistical Analysis

Statistical software for social sciences was used to analyze the studied data (SPSS Version 26, Chicago, US). Descriptive statistical methods were used to summarize the data on demographic features and responses to questions regarding all questionnaire sections. The data were reported as frequencies (F), Standard deviation (SD), and percentages (%) for categorical variables. Pearson's R test was applied to correlate data variates. Statistical significance was accepted as a P-value < 0.05.

RESULTS

Demographic Features of Participants

Four hundred sixty patients were approached to participate in this study, but only four hundred ten agreed to complete the survey, bringing the acceptance rate to 89.1%; all data is presented in Table 1.

TABLE 1. Demographic data of participants

Properties	Responses	N (410)	%	SD	P value
Home Residence	Yes	32	7.8%	0.268	0.000
	No	378	92.2%		
Gender	Male	212	51.7%	0.500	0.489
	Female	198	48.3%		
Age Group	65-74	264	64.4%	0.650	0.000
	75-84	110	26.8%		
	≥85	36	8.8%		
Level of Education	Illiterate	88	21.5%	1.144	0.004
	Primary	104	25.4%		
	Secondary	86	21.0%		
	Graduate	132	32.2%		
Income	Yes	288	70.2%	0.457	0.000
	No	122	29.8%		
Chronic Diseases	Yes	348	84.8%	0.358	0.000
	No	62	15.1%		
Number of Chronic Disease	No chronic Diseases	62	15.1%	0.738	0.000
	Less than two chronic diseases	120	29.3%		
	2-4 Chronic Diseases	228	55.6%		
	More than 4 Chronic Diseases	0	0.0%		
Number of current regular medications	No regular medication	62	15.1%	0.857	0.000
	Less than two regular medications	60	14.6%		
	From 2-4 medications	246	60%		
	≥4	42	10.2%		

Data in the above table demonstrated that only a few patients (7.8%) were home care residents and revealed no significant differences in patient gender, as data showed 51.7% male patients compared to female (48.3%). Most participants were 65-74 years old, with a percentage of 64.4%, and most had income (70.2%). The education part data showed that all participants' education levels were comparable. For the chronic disease part, the results showed that most patients had chronic disease (84.8%), with the majority having two or more chronic diseases (55.6%), and 60 % of them were prescribed more than 2-4 regular medications.

This study discussed the types of chronic diseases common in senior patients and showed that 36.55% of patients had Cardiovascular chronic disease (CVD), 25.5% had Diabetes (DM), and 11.7% had Gastrointestinal disorders (GIT), which were the highest prevalence chronic diseases among the geriatric community of Karbala. These chronic diseases are represented in Figure (1).

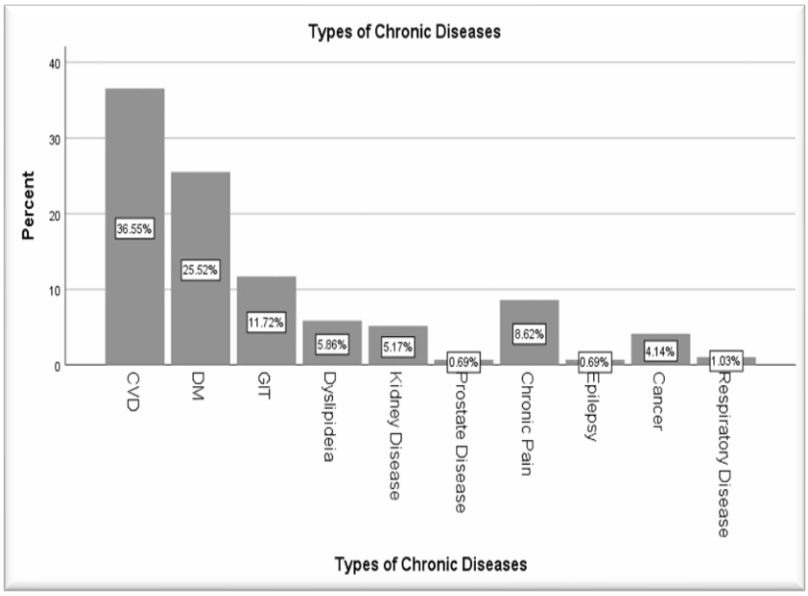

FIGURE 1. Type of chronic disease in the senior community in Karbala

Data on patients' use and perception of herbal remedies revealed that 51.22% of patients use herbal remedies compared to 48.7% of those who don't use herbal products. Figure 2 expresses these results.

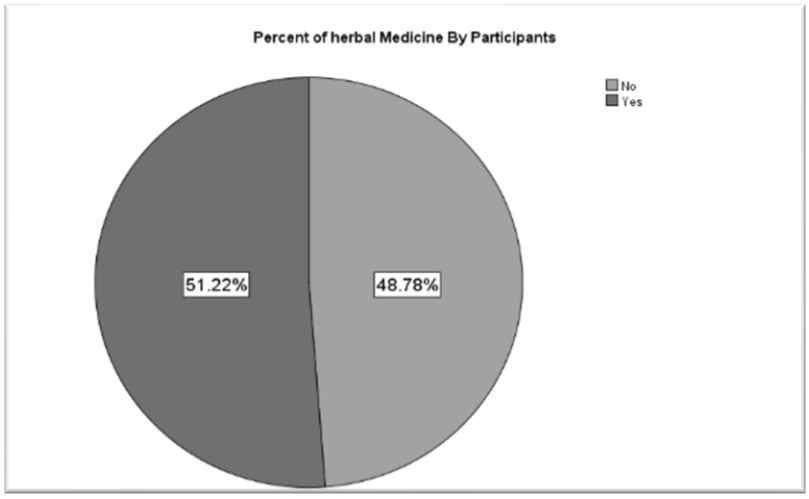

FIGURE 2. Percent use of herbal remedies by participants

Correlating herbal use with patient age, results showed that 43.6% of patients in the 65-74 age range mostly use herbs, as shown in Figure 3.

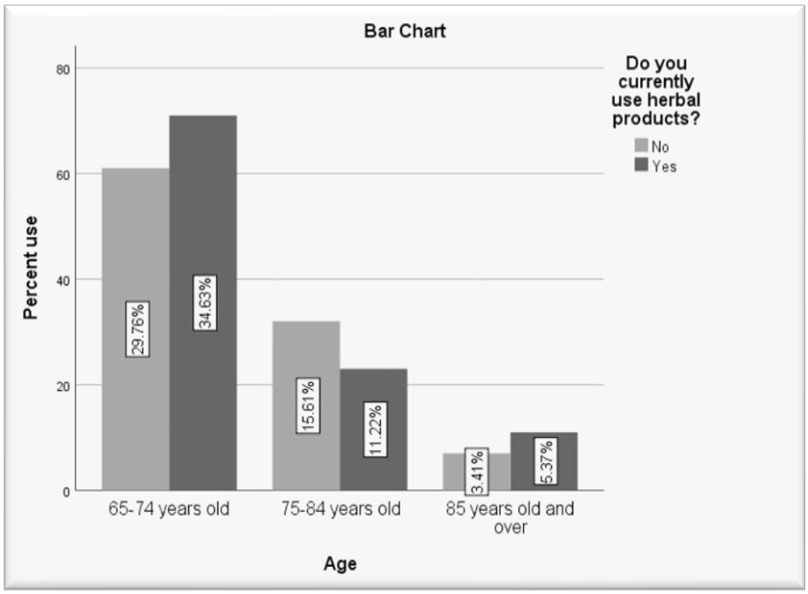

FIGURE 3. Correlation between patient age and herbal use

Moreover, data revealed a critical point: 41.4 % of patients with chronic diseases use herbal products to treat their ailments, as seen in Figure 4.

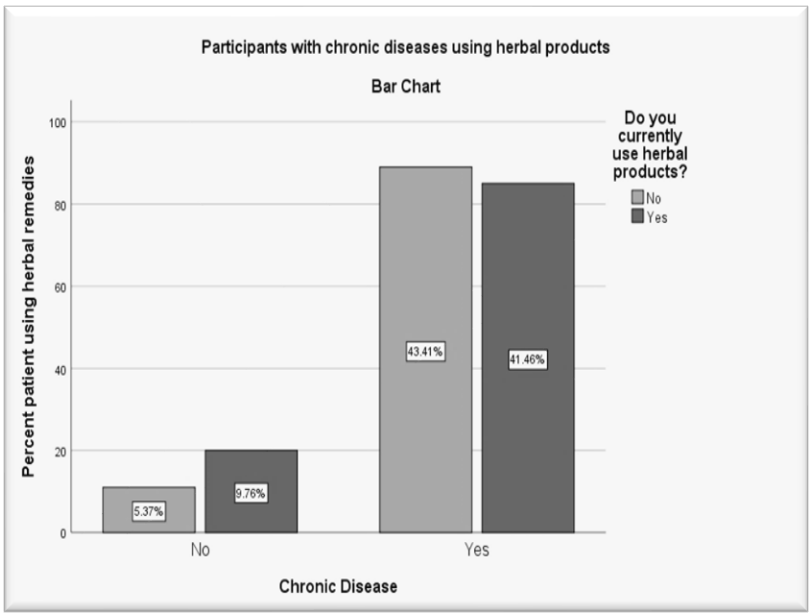

FIGURE 4. Correlation between chronic disease and herbal use

In the last part of correlating herbal use to patients' characteristics, data showed that 26.8% of patients who regularly take their medications (2 to 4) use herbal remedies for their symptoms, as presented in Figure 5.

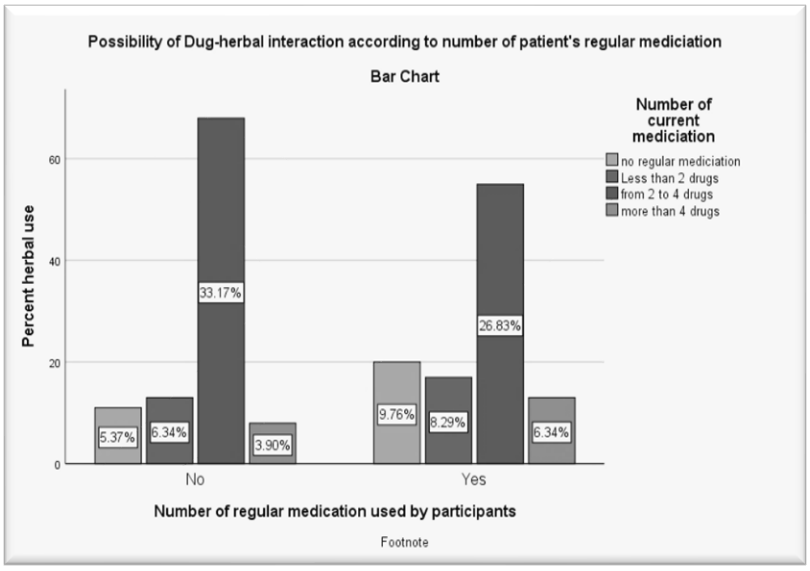

FIGURE 5. Correlation between herbal use with patients on regular medications

Data also showed that 24.8% of patients believe that herbs are safe to use, and 14.1% demonstrate that they use them due to their affordability, as shown in Figure (6).

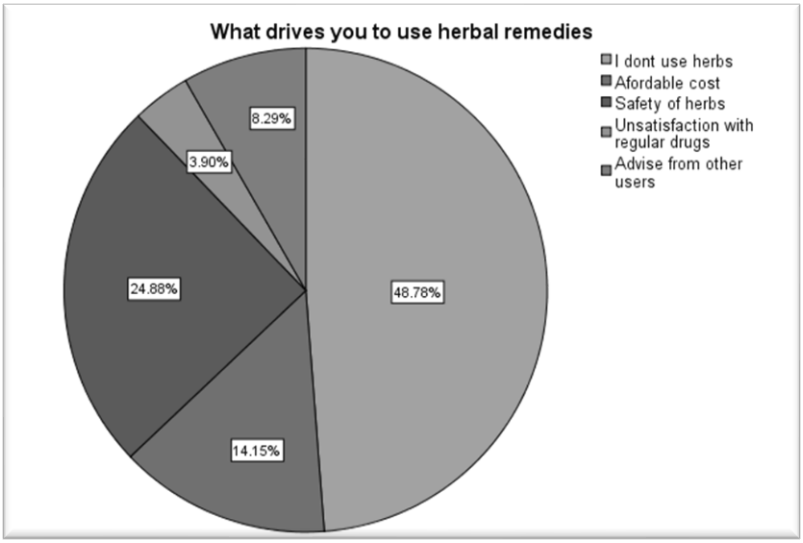

FIGURE 6. Factors driving patients to use herbal products.

The complete analysis of patient demographics and their correlation with herbal use is demonstrated in Table 2, proving significant differences in herbal products related to patients with chronic disease. Still, all other variables showed no significant differences ($P< 0.05$).

TABLE 2. Correlation between herbal use and patient properties

Herbal Use			No	Yes	Total	R	P-value
Age Group	65-74	N	122	142	264	-0.024	0.626
		%	46.2%	53.8%	100.0%		
	75-84	N	64	46	110		
		%	58.2%	41.8%	100.0%		
	≥85	N	14	22	36		
		%	38.9%	61.1%	100.0%		
Level of Education	Illiterate	N	50	38	88	0.042	0.397
		%	56.8%	43.2%	100.0%		
	Primary	N	48	56	104		
		%	46.2%	53.8%	100.0%		
	Secondary	N	36	50	86		
		%	41.9%	58.1%	100.0%		
	Graduate	N	66	66	132		
		%	50.0%	50.0%	100.0%		
Income	No	N	52	70	122	-0.080	0.105
		%	42.6%	57.4%	100.0%		
	Yes	N	148	140	288		
		%	51.4%	48.6%	100.0%		
Chronic Diseases	No	N	22	40	62	-0.112	0.023
		%	35.5%	64.5%	100.0%		
	Yes	N	178	170	348		
		%	51.1%	48.9%	100.0%		
		%	48.8%	51.2%	100.0%		
Number of Chronic Diseases	No Chronic Diseases	N	22	40	62	-0.086	0.081
		%	35.5%	64.5%	100.0%		
	Less than 2	N	62	58	120		
		%	51.7%	48.3%	100.0%		
	From 2 to 4 diseases	N	116	112	228		
		%	50.9%	49.1%	100.0%		
Number of Regular Medication	No regular medication	N	22	40	62	-0.087	0.079
		%	35.5%	64.5%	100.0%		
	Less than 2	N	26	34	60		
		%	43.3%	56.7%	100.0%		
	From 2 to 4	N	136	110	246		
		%	55.3%	44.7%	100.0%		
	≥ 4 drugs	N	16	26	42		
		%	38.1%	61.9%	100.0%		

Figure 7 shows that patients usually use herbs on the advice of relatives and friends rather than the recommendation of their doctors or pharmacists.

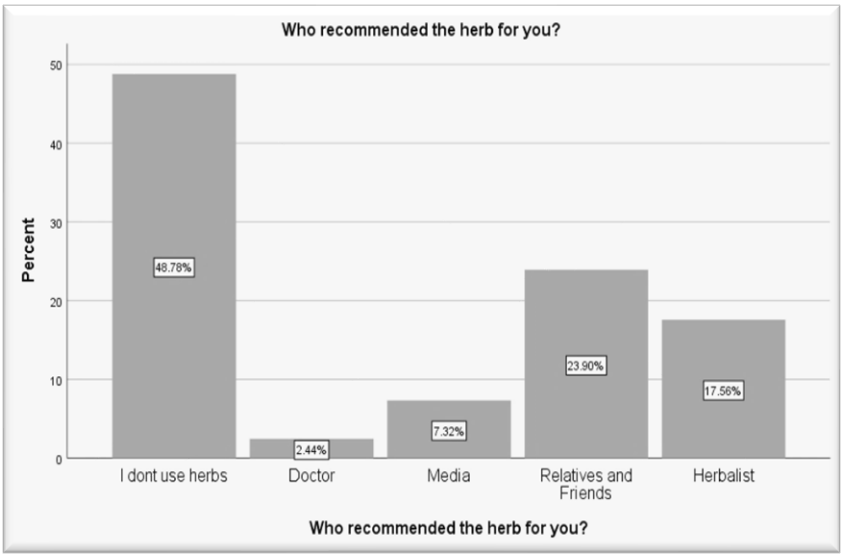

FIGURE 7. Recommendation of herbal use by patients

In determining the safety of herbal use by patients, results showed that 47.3% of patients use herbs for their chronic disease compared to 52.7% for minor symptoms. Data also revealed an interesting point: 73.7% of these patients do not disclose their use to their physician, and 76.1 % are unaware that herbal products could interact with their current medications (Table 3). Moreover, the data showed no significant difference between the level of education and disclosure to physicians.

TABLE 3. Safety of herbal products used.

Questions about the safety of herbs	Responses	N (410)	Percent	SD	P value
Use of Herbal Medicine	Chronic Diseases	194	47.3%	0.499	0.277
	Minor Symptoms	216	52.7%		
Disclosure of herbal use to doctors	Yes	108	26.3%	0.441	0.000
	No	302	73.7%		
Aware of Drug- herbal interaction	Yes	98	23.9%	0.427	0.000
	No	312	76.1.%		

The last part of the survey listed the herbs most used by the senior patients residing in Karbala, as represented in Table 4.

TABLE 4. List of commonly used herbs in the senior community of Karbala (Continued)

Herb Common Name	Medicinal plant Scientific Name	Treatment As per patients	Use as cited in references	Part plant use
Ginko	Ginko biloba	Memory improvement,	Enhance memory and improve circulation (20)	Leaves
Garlic	Allium sativum	hypercholesterolemia and hypertension	hypercholesterolemia and hypertension (20)	Bulbs
Green Tea	Camellia sinensis	Anxiety, antioxidant	Antioxidants, anti-inflammatory, reduce cholesterol (21)	Leaves
Ginseng	Panax ginseng	General tonic	Tonic and regulate blood sugar (22)	Roots
Dried black lemon	Citrus aurantifolium	Hypertension	Antibacterial and anti-hypertensive (23)	Dried fruit

Herb Common Name	Medicinal plant Scientific Name	Treatment As per patients	Use as cited in references	Part plant use
Borage or Starflower	Borago officinalis	Cold and anti-inflammatory bronchitis	rheumatoid arthritis, acute respiratory distress syndrome, atopic dermatitis, and diabetic neuropathy (24)	Flowers and leaves
Chamomile	Matricaria chamomilla	Spasmolytic and IBS	Anxiety, insomnia, dyspepsia, flatulence (25)	flowers
Clove	Syzygium aromaticum	Local anesthetic for dental pain	anti-inflammatory, antibacterial agent, and an agent that soothes or relieves pain for dental emergencies (26)	Dried flower buds
Fenugreek	Trigonella foenum-graecum	Diabetes (hypoglycemic agent)	anti-inflammatory, hepatoprotective, cardioprotective, neuroprotective, and antidiabetic (27)	Seeds
Cinnamon	Cinnamonum verum	Anti-inflammatory Carminative	Anti-inflammatory Carminative (28)	bark
Anise	Pimpinella anisum	Flatulence, digestive problems	Bronchitis, cough, digestive disorders, dyspepsia, flatulence (25)	Fruits (seeds)
Hibiscus	Hibiscus sabdariffa	Hypertension, hypoglycemic and antihyperlipidemic	Hypertension, hypoglycemic and antihyperlipidemic, antioxidant and anticancer (29)	Flowers (calyces)
Ginger	Zingiber officinale	Gastrointestinal disorders, antihyperlipidemic	Gastrointestinal disorders, antihyperlipidemic, Antioxidant (30)	Rhizome
black seeds	Nigella sativa	Anti-inflammatory for arthritis	treatment of several diseases and ailments, including asthma, bronchitis, and related inflammatory diseases (31)	seeds
Thyme	Thymus vulgaris	GIT disorders	antimicrobial, antitussive, spasmolytic, and antioxidant activity gastritis, colic (32)	leaves
Turmeric	Curcuma longa	Anti-inflammatory and used to improve CVS	treatment of stomach and liver problems, anti-carcinogenic, anti-inflammatory, anticoagulant, antimicrobial, and antioxidant impacts; aiding in wound healing, allergy, asthma, sinusitis, hepatic, and heart diseases (33)	rhizome
Flaxseed	Linum usitatissimum	Decrease cholesterol	Scientific evidence supports the consumption of flaxseed for the high content in omega-3 omega-6 rich oil, α-linolenic acid, lignans, high-quality proteins, and fibers, compounds which are	seeds

Herb Common Name	Medicinal plant Scientific Name	Treatment As per patients	Use as cited in references	Part plant use
			biologically active in the prevention of some chronic diseases such as many types of cancer, diabetes, cardiovascular diseases, and cerebrovascular stroke (34)	
Peppermint	Mentha piperita	Spasmolytic, carminative	Stimulant on the digestive tract and antiseptic properties (25)	leaves
Cumin	Cuminum cyminum	Spasmolytic, IBS	Antioxidant, antimicrobial agent used in GIT, anti-cancer, immunomodulatory agent, antitussive, and antidiabetic (35)	Dried fruits
Rosemary	Rosemarinus officinalis	Improve immunity and memory	studies demonstrated the antioxidant, diuretic, anti-inflammatory, anti-microbial, anti-carcinogenic, hypoglycemic, and hypolipidemic activities of rosemary (36)	leaves
Senna	Cassia acutifolia	Constipation	Laxative (37)	leaves

Figure 8 shows that the top seven herbs utilized by patients in this survey were Cinnamon (11.4%), Chamomile (11.0%), Anise (10.0%), Borage (7.6%), Garlic (7.1%), Ginkgo (6.2%), and Ginger (5.7%)

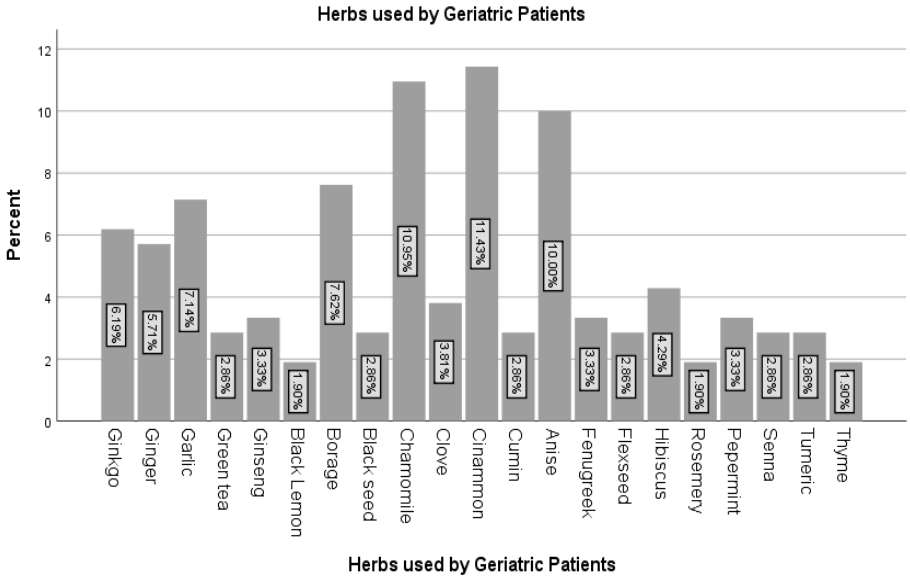

FIGURE 8. Commonly used herbs in the senior community of Karbala

DISCUSSION

Herbal medicines have gained significant popularity as a therapeutic modality. They are often perceived as natural and harmless [38]. Because chronic diseases are incurable, with some requiring complex regimens or acquiring high medical costs, some consumers use herbal remedies, thus exposing them to the risk of drug-herbal interaction [39]. Since herbal medicines are mixtures of more than one active ingredient, using multiple pharmacologically active compounds increases the chances of interactions. Hence, the opportunity for herb-drug interactions is theoretically higher than drug-drug interactions solely because synthetic drugs usually contain single chemical entities [40]. Several herbs offer the potential risks of specific adverse effects, the severity of adverse drug reactions regarding drug-induced problems in elderly patients, and their association with polypharmacy results in a more relevant appearance of adverse reactions [41]. Furthermore, research has uncovered crucial alterations in pharmacokinetics and pharmacodynamics as individuals age; this includes a reduction in renal and hepatic clearance of many drugs and an increase in the volume of distribution, especially for lipid-soluble medications, imposing a higher risk on elderly patients [42-44].

These facts led the authors to design this study and investigate the percentage of elderly patients using herbs concurrently with their regular medication to estimate the risk to patient health. Data revealed that most of the participants in this study were in the age group of 64-75. The typical chronic diseases in the area studied were CVD, DM, and GIT disorders, which accounted for more than three-quarters of participants. The treatment of these disorders usually requires more than two conventional therapies and their use lasts chronically, as shown by the results. The chronically treated conditions prompted patients to use herbal remedies, and our study revealed that more than half of the participants used herbal remedies for different reasons. Linking the demographic characteristics to herbal usage, data showed no significant difference in herbal use among gender, level of education, and income. This contrasts with other studies, which indicated that most users were female and educated participants [45-48]. Interestingly, our data showed that a quarter of participants believe that herbal remedies are entirely safe to use, 73.7% do not disclose their use to their physician, and 76.1 % need to be aware that herbal products could interact with their current medications. These facts highlight a critical point regarding the safety and risk of patient health. It was also found that most herbal recommendations were from relatives and friends rather than health care professionals, which also adds additional risk. The study also revealed that elderly patients in the studied area used about twenty-one different herbal remedies, with seven having the highest rate of use presented by Cinnamon, Chamomile, Anise, Borage, Ginger, Garlic, and Ginko. The most reported herbal supplement in 50% of the studies in different countries was ginkgo biloba [49-51]. It has been stated to boost memory and enhance blood circulation [49]. Reports demonstrated that this remedy interacts with several medications. One of the most used medications, especially in the elderly, is proton pump inhibitors (PPI). Ginkgo reasonably drops omeprazole levels. Most other proton pump inhibitors are likely equally affected [52]. In addition, the use of ginkgo with antiplatelet drugs and anticoagulants may increase the risk of bleeding complications because both ginkgo and these drugs decrease the blood's ability to clot [53]. This interaction also applies to garlic and ginger, both of which have been found to have blood-thinning properties [20].

In the discussion of cinnamon interactions, some studies reported the enzymatic inhibition of CYP2A6 by cinnamaldehyde, a common constituent of cinnamon [54]. Other studies demonstrated the hypoglycemic activity of cinnamon with a possible synergistic effect on the action of oral hypoglycemic agents [55]. Moreover, a recent study showed the impact of cinnamon on the pharmacodynamic parameters of amlodipine, a commonly prescribed antihypertensive drug [56]. Some studies reported bleeding cases when Chamomile and borage were combined with warfarin, as Chamomile and borage have an anticoagulant effect [57,58].

As most of the participants in our study had CVD, DM, and GIT disorders, the probabilities and risk of interaction are a concern, especially since patients do not disclose their herbal consumption to healthcare professionals. Studies regarding Drug-herbal interactions, effectiveness, and safety of herbal use in the elderly population are limited, mainly since herbal medicine is considered complementary and not regulated by the FDA guidelines. These facts give the current study its importance and encourage further studies to be performed to ensure the safe use of herbs.

CONCLUSION

This study highlights the importance of patient education regarding herbal usage as it concludes the high utilization of herbal remedies by elderly patients who have multiple chronic disorders and utilize more than two conventional medications. Patients do not disclose their herbal usage to their health care professionals, which exposes them to the risk of drug-herbal interaction, especially those patients who are unaware of the herbal adverse effects.

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