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Research Article

Herbal Remedy Usage Habits of Patients Applying to the Headache Clinic

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ABSTRACT

Aim: Although the widespread use of unguided herbal remedies as alternative therapies is increasingly common, it poses significant risks of adverse drug interactions and side effects. This study aimed to investigate the patterns of herbal remedy use, particularly in the management of a common health complaint, headache.

Material and Methods: Following ethics approval, this cross-sectional study evaluated sociodemographics, attitudes, recommendation sources, and side-effect awareness via face-to-face surveys with 133 participants (June 2022–December 2023), recording unanswered items as missing data.

Results: Among the 133 participants, 96(72.2%) were female, 26(19.5%) were male, and 11(8.3%) chose not to disclose their gender due to privacy-related concerns. Herbal remedy use was reported by 35.3%(n=47) of participants, and garlic was identified as the most frequently used herbal remedy. It was determined that 35.3%(n=47) of the participants were consuming herbal remedies and the most commonly used herbal remedy was garlic. No statistically significant relationship was found between gender and education level according to herbal remedy use (p=0.222, p=0.189, respectively). Participants stated that they mostly used herbal remedies to support the effectiveness of prescription drugs they took for headaches. It was determined that the consumers most frequently received advice from doctors regarding herbal remedy use 42.6%(n=20) and only 46.8%(n=22) were informed about the possible side effects of herbal remedies.

Conclusion: Gender and education level were not significantly associated with herbal remedy use among headache clinic patients. Given limited patient awareness of potential adverse effects, healthcare providers must understand herbal pharmacokinetics and drug interactions to ensure safe treatment.

Keywords: Headache, herbal remedy, herb-drug interaction, phytotherapy.

INTRODUCTION

Headache is one of the most common types of pain worldwide and can seriously affect quality of life. In the United States of America (USA), millions of people present to healthcare services every year with the complaint of headache (1). In Türkiye, headache is a common complaint and affects a large proportion of the population. Especially migraine and tension-type headaches are the most common causes of loss of quality of life due to headache (2).

It is known that pharmacological agents (such as non-steroidal anti-inflammatory drugs (NSAIDs) and triptans) used in the treatment of headache have side effects and may cause toxicity in long-term use (3). In addition, persistence of symptoms despite pharmacological treatments in some patients highlights the need for complementary strategies in headache management.

According to the World Health Organization (WHO), complementary and alternative medicine (CAM) practices are widely used in Europe, Australia and North America and it is estimated that this rate has reached 50% among people with chronic pain (4). In Türkiye, many people with chronic disease prefer herbal remedies and other CAM methods (5). Herbal remedies, botanical remedies, or phytomedicines come from plants or natural sources and are used to support health or manage illnesses. Herbal supplements, in particular, are intended for consumption of

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herbal remedies. Some examples of herbal supplements are; Garlic, Ginkgo biloba, Ginseng, St. John's wort (6). According to USA 2017 data, the most popular CAM method in the USA was determined as Natural remedies/herbal medications. Some of the other methods in the top 10 are: Osteopathic manipulation and chiropractic treatment, massage, Yoga and Homeopathic therapy (7).

Patient education is of great importance regarding the efficacy and safety of complementary methods used in the treatment of headache. In studies, it has been reported that patients who prefer CAM methods are not sufficiently informed about the safety of these applications and possible drug interactions and therefore have the risk of being misinformed (8). This situation reveals the responsibility of clinicians to inform and raise awareness of patients on this subject.

In this study, the prevalence of herbal remedy use in patients presenting to the headache outpatient clinic will be investigated and the relationship between the sociodemographic characteristics of the patients and this use will be evaluated.

MATERIAL AND METHODS

This cross-sectional study was planned in accordance with the Declaration of Helsinki, in line with the approval number 7198 GOA (Decision No: 2022/18-07, Date 18.05.2022) received from the Non-Interventional Ethics Committee of Dokuz Eylül University. It was conducted by including 133 patients who applied to the headache clinic of Dokuz Eylül University Faculty of Medicine Hospital between June 1, 2022 and December 31, 2023. The inclusion criteria for participation in the study were attendance at the headache clinic, age ≥18 years, and voluntary consent to participate in the study. Reasons for exclusion from the study were determined as being under 18 years of age, not being able to communicate effectively, and not volunteering to participate in the study. Survey questions that participants did not want to respond due to concerns about information security, possible biases against survey participation or concerns that treatment algorithms might change were left blank.

Survey Application

A survey form consisting of 15 questions was used as a data collection tool. The surveys were conducted face-to-face in a quiet environment where the patient felt comfortable. The researcher read the questions in the survey form to the patients and marked the verbal answers given by the patients on the survey form. The average duration of the interviews varied between 5 and 10 minutes. Participants were asked their opinions about various herbal remedies shown in the survey form, and whether they used herbal remedies or not, and if so, which one they used, were recorded. Participants were also asked whether they used vitamin or mineral supplements.

Data collection was performed using a semi-structured descriptive questionnaire designed to capture factual information regarding the types, sources, and frequencies of herbal remedy use. Because the survey was designed as a factual reporting form rather than a psychometric score-based scale, formal reliability testing (e.g., internal consistency coefficients) was not applicable. However, face validity and question clarity were verified through a preliminary review by independent clinical experts prior to deployment.

Participants were queried regarding the specific types of herbal preparations utilized (e.g., aqueous extracts/teas, oils, or capsule supplements), the primary source from which they obtained them (e.g., commercial pharmacies vs. local traditional herbal markets) and their specific methods of use (i.e., oral consumption for teas, garlic, and supplements, vs. local topical application via massage for essential oils. However, because the vast majority of these practices involved non-prescribed, traditional usage, standardized data regarding precise daily dosages, frequent preference for oral administration or active ingredient concentrations could not be systematically recorded.

Participants were asked separate questions about whether they regularly used herbal remedies and vitamins in the last three months. The reason for choosing this approach is that in previous studies in the literature, when patients were directly presented with a list of herbal remedies, they often received a response of "I do not use" (5). Therefore, this method was adopted in our study to obtain more accurate and detailed information. Before starting the study, participants were informed about the purpose of the study and signed informed consent forms.

The survey form used in the study included questions about the participants' herbal, vitamin and mineral remedy usage habits (10 questions), current health problems (2 questions) and socio-demographic characteristics (3 questions such as gender, age, education level). The content of the survey was prepared in accordance with the literature by carefully examining existing scientific publications on the subject (5,8,9).

Power Analysis

The sample size calculation for this study was informed by a comparable neurological cohort in the literature evaluating complementary medicine use among patients with chronic headache syndromes. Based on the baseline compliance and prevalence structures reported by Tong et al., where a cohort of 132 patients with chronic tension-type headaches was successfully tracked, a post-hoc or a-priori power estimation was contextualized using G*Power software (v3.1.9.7) (10). Assuming a medium effect size, a significance level (α) of 0.05, and a target statistical power (1- β) of 90%, it was determined that a minimum sample size of 121 participants was required to reliably evaluate the behavioral patterns and characteristics of herbal remedy utilization. To accommodate a potential 10% data attrition or incomplete survey rate, the final sample size was adjusted, resulting in the inclusion of a total of 133 patients in our final cohort.

Statistical Analysis

Statistical analysis of the data obtained in the study was performed using IBM SPSS 24.0 statistical package program. Kolmogorov-Smirnov (if the number of patients are >30) and Shapiro-Wilk (if the number of patients are <30) tests were applied to determine whether the data showed normal distribution. Frequency variables are expressed as frequency (n) and percentage (%), and variables that take continuous values are expressed as mean ± standard deviation. The difference between the two groups was determined by the Mann Whitney U test for variables with continuous values that were not normally distributed, the Student t-test for variables with continuous values with

a normal distribution, and the Pearson Chi-Square and Fisher Exact tests for categorical variables. The significance level was accepted as 0.05 in all statistical analyses.

RESULTS

The average age of the 133 individuals who participated in our study was calculated as 46.83 ± 16.67. When we look at the gender distribution of the participants, 72.2% (n=96) are women and 19.5% (n=26) are men. As a result of the statistical analysis, no significant relationship was found between the age and education levels of the participants and their gender (p = 0.239, p = 0.529, respectively) (Table 1). When the chronic diseases of the participants were examined, it was determined that the most common chronic disease was hypertension (29.3%, n=39), followed by chronic low back pain (12%, n=16). In the evaluation made in terms of gender, a significant difference was found only in the presence of chronic low back pain (p = 0.021). The frequency of chronic low back pain was found to be higher in male participants than in females (Table 1).

Table 1. Comparison of age and education level by gender

Sociodemographic Characteristics	Percentage of Women, % (n)*	Percentage of Men, % (n)*	p	Total percentage, % (n)*
Age (Year)				
<35	29.8 (17)	14.3 (2)	0.324**	26.8 (19)
35 and above	70.2 (40)	85.7 (12)		73.2 (52)
Education level				
Illiterate	3.7 (3)	-	0.529***	2.9 (3)
Primary School	24.7 (20)	13.6 (3)		22.3 (23)
Middle School	12.3 (10)	18.2 (4)		13.6 (14)
High School	19.8 (16)	27.3 (6)		21.4 (22)
Master	12.3 (10)	4.5 (1)		10.7 (11)
University	27.2 (22)	36.4 (8)		29.1 (30)
Chronic Diseases^				
Diabetes	5.2 (5)	11.5 (3)	0.247**	6 (8)
Hypertension	28.1 (27)	30.8 (8)	0.791***	28.7 (35)
Thyroid Dysfunction	8.3 (8)	-	0.128**	6.6 (8)
Cardiac Disease	5.2 (5)	3.8 (1)	0.776**	4.9 (6)
Pulmonary Disease	1 (1)	-	0.601**	0.8 (1)
Chronic Low Back Pain	7.3 (7)	23.1 (6)	**0.021*** **	10.7 (13)
Other Diseases	40.6 (39)	46.2 (12)	0.612***	41.8 (51)

*Percent of rows, p<0.05 statistically significant, bold font statistically significant.
^Evaluation was made based on the participants who may have more than one chronic disease and who did not want to answer this survey question.
**: Fisher's Exact Test.
***: Pearson Chi-Square Test.

36.1% (n=48) of the applicants were using vitamin D and 37.6% (n=50) were using vitamin B12. When the participants' vitamin B12, vitamin D and herbal remedy use were examined according to gender, no significant difference was found (p=0.491, p=0.050, p=0.222, respecitively). However, in the subgroup analysis, 92.6% (n=25) of those using vitamins and herbal remedies together were women, and this finding was found to be statistically significant (p = 0.043) (Table 2).

Table 2. Use of vitamins and herbal remedies by gender.

Remedy used	Percentage of Women, % (n)*	Percentage of Men, % (n)*	p	Total percentage % (n)*^
Any Vitamin	82.4 (56)	17.6 (12)	0.244**	56.2 (68)
Vitamin B12	81.6 (40)	18.4 (9)	0.491**	40.5 (49)
Vitamin D	88.4 (38)	11.6 (5)	0.050**	35.5 (43)
Herbal Remedy	84.4 (38)	15.6 (7)	0.222**	35.9 (45)
Herbal Remedy + Vitamin	92.6 (25)	7.4 (2)	**0.043*** **	22.3 (27)

*Percent of lines, Bold font: Statistically significant, p<0.05 statistically significant.
^Total percentage of the use of vitamins and herbal remedies according to those who answered the gender question in the survey.
**: Pearson Chi-Square Test.
***: Fisher's Exact Test.

It was determined that 35.3% (n=47) of the patients participating in the survey used herbal remedies, and the most frequently preferred herbal remedies were garlic, followed by cinnamon, green tea and ginger (Table 3).

Table 3. Use and types of herbal remedies among all participants.

Types of Herbal Remedies	% (n)
Garlic	17.3 (23)
Aloe	0.8 (1)
Thyme	3.8 (5)
Ginger	9.8 (13)
Cinnamon	11.3 (15)
Green Tea	10.5 (14)
Gingko Biloba	4.5 (6)
St. John's Wort	7.5 (10)
Cascare	2.3 (3)
Licorice	1.5 (2)
Nigella sativa, Herbal tea	3 (4)

Of the herbal remedy users who participated in the study, 37.2% (n=16) reported consuming herbal remedies once a day and 25.6% (n=11) reported consuming herbal remedies once a week. No significant difference was detected between the frequency of herbal remedy use and gender, age and education level (p = 0.834, p = 0.145, p = 0.406, respectively) (Table 4).

It was determined that 51.1% (n=68) of the participants in the study were high school or university graduates. Among the people using herbal remedies, 69% (n=29) were high school or university graduates. No statistically significant relationship was found in the comparison between herbal remedy use and education level (p = 0.189). However, when looking at specific herbal remedies such as green tea and gingko biloba, a significant relationship was found with education level. 92.9% (n=13) of green tea users and all gingko biloba users (100%, n=6) had a high school or university degree level education (p = 0.009 and p = 0.045, respectively) (Table 5).

Table 4. Evaluation of the frequency of herbal remedy use according to gender, age and education level.

	Women, % (n)*	Men, % (n)*	p	Age < 35 years*	Age >35 years*	p	Primary or Middle School Graduates % (n)*	High school or University Graduates % (n)*	p
Once a day	93.8 (15)	6.3 (1)	0.834	14.3 (1)	85.7 (6)	0.145	40 (6)	60 (9)	0.406
Once every two days	100 (3)	-		33.3 (1)	66.7 (2)		-	100 (3)	
Once a week	90 (9)	10 (1)		66.7 (4)	33.3 (2)		40 (4)	60 (6)	
Twice a week	100 (5)	-		66.7 (2)	33.3 (1)		-	100 (4)	
Once a month	100 (2)	-		100 (1)	-		50 (1)	50 (1)	
Sometimes	80 (4)	20 (1)		-	100 (3)		16.7 (1)	83.3 (5)	

*Percent of lines, p<0.05 statistically significant.
Pearson Chi-Square Test.

Table 5. Use and awareness of the side effects of herbal remedies by educational level.

	Primary or Middle School Graduates % (n)*	High school or University Graduates % (n)*	p
Herbal Remedy Users	31 (13)	69 (29)	0.189**
Green Tea Users	7.1 (1)	92.9 (13)	**0.009*** **
Gingko Biloba Users	-	100 (6)	**0.045*** **
Awareness of the Herbal Remedies' Side Effects	15 (3)	85 (17)	0.072***

*Percent of lines, Bold font: Statistically significant, p<0.05 statistically significant.
**: Pearson Chi-Square Test.
***: Fisher's Exact Test.

29.8% (n=14) of the participants who used herbal remedies stated that they had previously informed their physician that they had used herbal remedies without asking the physician. On the other hand, only 27.7% (n=13) stated that their physicians asked about their use of herbal remedies.

When examining how they started using herbal remedies, it was determined that 42.6% (n=20) of the participants learned about them through the recommendation of a doctor and 21.7% (n=10) through newspapers, the internet and other media and turned to these remedies (Table 6). No statistically significant difference was detected in the comparisons made between demographic characteristics such as gender, age and education level and recommendation sources (p = 0.975, p = 0.571, p = 0.414, respectively). When the reasons for using herbal remedies are examined, all of the users stated that they use herbal remedies to strengthen the effect of the medications they use for headache treatment.

Tablo 6. Sources of recommendation during herbal remedy use.

Source of Recommendation	% (n)^
Doctor's recommendation	42.6 (20)
Newspapers, online media	21.7 (10)
Friends suggestion	4.3 (2)
Recommendation from family elders	17.02 (8)
Other	10.6 (5)

^Among herbal remedy users who indicated the source of recommendation.

46.8% (n=22) of herbal remedy users who participated in the study stated that they were aware of the side effects of these remedies. The majority of participants (85%, n=17) who were knowledgeable about its side effects were high school or university graduates. However, as a result of the statistical analysis, it was determined that there was no significant relationship between education level and knowledge of side effects (p = 0.072) (Table 5). Similarly, in the analyzes made according to the gender variable, no significant difference was found in terms of knowledge of side effects (p = 0.107).

Finally, 70% (n=14) of the participants who used herbal remedies reported that they had received information about the side effects of the remedies from their doctors, and 15% (n=3) reported that they had accessed this information through newspapers, the internet and other media.

DISCUSSION

Interest in herbal remedies has increased in recent years due to their perceived potential to improve physical and cognitive well-being in a wide range of conditions, including respiratory tract infections, gastrointestinal system disorders and psychiatric disorders, as well as chronic diseases such as cancer, diabetes and hypertension. In particular, the side effects caused by conventional painkillers are often linked to patients' inclination toward herbal remedies that are thought to have fewer side effects (5). The aim of this study was to investigate the attitudes of patients applying to a headache clinic towards herbal remedies, and to evaluate the associations between herbal remedy use and participants' sociodemographic characteristics, including sex, age, educational level, and comorbidities.

In our study, it was determined that 35.3% (n=47) of the patients presenting to the clinic consumed herbal remedies regularly. The most frequently used remedies were determined to be garlic, cinnamon and green tea, respectively. Although no significant relationship was observed between education level and overall herbal remedy use, subgroup analyses revealed significant associations between educational level and the use of green tea (*Camellia sinensis* (L.) Kuntze) and Maidenhair tree (*Ginkgo biloba* L.). In particular, it has been determined that the majority of those using these remedies have a high school or university level education. No significant difference was found between the participants' use of vitamins or herbal remedies according to their gender. In addition, it is noteworthy that 92.6% (n=25) of those who used vitamins and herbal remedies together were women, and this finding was found to be statistically significant.

Recurrent headaches, such as migraine, are listed by the WHO as the seventh most common cause of disability worldwide and the most common of all neurological disorders, and have been reported to cause a large economic burden on both patients and society. According to recent epidemiological studies, roughly 1 in 6 men and 1 in 5 women in the USA suffer from headaches, causing an annual economic burden of 36 billion dollars (11). The history of headache treatment before the late 19th century relied largely on physical and herbal therapies. An Egyptian remedy for headaches, discovered in a papyrus dating to approximately 2500 BCE, involved the application of a clay crocodile filled with herbs to the patient's head. Oral medicinal plants were mentioned in medical texts from Hippocrates and Galen to Sir William Osler, and among the headache remedies used in the Middle Ages, poppy extract (opium), mandrake (belladonna), henbane and valerian was included. Ergot, obtained from the rye mushroom Claviceps purpurea, which was used in the treatment of headaches in the early 20th century, is also referred to as another "herbal" treatment (12).

In our study, it was determined that the use of herbal remedies among the participants was 35.3% (n=47) and the most frequently used remedies were garlic, cinnamon and green tea. It has been reported that the most frequently used CAM method in patients with headaches in Türkiye is phytotherapy with a rate of 37.5% (13). In a study conducted in Thailand, the prevalence of herbal remedy use in the last 12 months among 1374 participants diagnosed with chronic diseases was found to be 35.9%, similar to our study (14). There are studies in the literature reporting the use of herbal remedies at a rate of 35% in the USA, 29% in Malaysia, and 43.6% in Vietnam (14-16). In a study involving 387 patients diagnosed with Type 2 DM in Ethiopia, it was reported that the most commonly used herbal remedy was garlic, and in a meta-analysis in which 87 studies were examined, it was reported that the most frequently used herbal remedy for headache in Africa was Ocimum gratissimum and *Allium sativum* L. (garlic) in second place (17,18). Garlic, which has been used in medicine for a long time due to the biologically active component it contains, Allicin, is reported to be effective in the treatment of diseases such as cancer, hypertension, hyperlipidemia and headache (19). In addition, there are also publications indicating that peppermint is used most frequently in Germany and turmeric in Saudi Arabia (20,21). Our research findings show that the rate of individuals using herbal remedies as complementary medicine methods is parallel to the information in the literature. The diversity of the most commonly used herbal remedies in different geographies can be explained by factors such as cultural beliefs, climatic conditions of that region and plant species grown.

Crucially, a remarkable intersection was observed between the clinical demographics and the specific botanical preferences of our cohort. While hypertension emerged as the most prevalent chronic comorbidity (29.3%, n=39), garlic (*Allium sativum* L.) was simultaneously documented as the most frequently utilized herbal remedy among the participants. In clinical literature, garlic is widely recognized not for immediate analgesic properties, but rather for its definitive cardiovascular benefits, particularly its capacity to modulate systemic blood pressure through standard endothelial nitric oxide synthesis and subsequent smooth muscle vasodilation.In light of this physiological context, it can be interpreted that the high prevalence of garlic consumption in our study population may not be driven by a desire for direct headache mitigation. Instead, these patients likely utilized garlic primarily for blood pressure regulation, thereby seeking to secondary control or prevent hypertensive headache exacerbations. This potential overlap highlights a critical double-edged sword in patient safety; although patients may naturally attempt to manage their comorbidities with such remedies, the concurrent use of garlic with conventional antihypertensive

or antiplatelet agents significantly amplifies the risks of undetected drug-herb interactions, such as hypotension or altered bleeding times. This reinforces the necessity for active screening by treating physicians.

In our study, the most frequent usage frequency of individuals using herbal remedies was determined as once a day with 37.2% (n = 16). According to studies evaluating the frequency of use in the literature, the most frequent use was once a day in people applying to pain clinics in Türkiye with 37.9%, once a day in university students and their families with 27.7%, and once a day in Thailand with 52.6% (8,22,23). In a study conducted in Bulgaria, the most common usage method by consumers was determined as once for several months with 42.7% (24). The ease of access to herbal remedies without a prescription and their affordable prices may contribute to their frequent use in daily life. Our findings indicated that 21.7% of the participants turned to herbal remedies through online media and newspapers. Based on this specific data and in line with the literature, it can be interpreted that the intense promotion of natural remedies by modern media may play an active role in shaping consumer habits by increasing individual interest.

The relationship between gender and herbal remedy use is intriguing. In a study involving 450 participants in Saudi Arabia, women were found to be more likely to use herbal remedies than men. The authors emphasized that women are more likely to exaggerate the effectiveness of herbal remedies and encourage each other to use these remedies (25). In the literature, these patterns among women are frequently associated with factors such as regulating menstruation during puberty, seeking a safe therapy during pregnancy to prevent potential miscarriages, and alleviating symptoms while delaying degeneration during menopause (25,26). In the USA, in the study where data collected from 25,500 participants through the "2015 National Consumer Survey on the Medication Experience and Pharmacists' Roles" were examined, no significant relationship was found between herbal remedy use and gender (15). In our study, no significant difference was found between herbal remedy use according to gender. This can be explained by the fact that our study evaluated its use only in a limited number of patients with headache. We believe that future studies with more participants in different disciplines and in different countries may shed light on the issue.

Another interesting issue is the reasons why individuals use herbal remedies. It has been suggested in the literature that reasons such as strengthening the immune system in Bulgaria, Poland and Türkiye, treating acute and chronic diseases in Germany, and stroke, cancer, diabetes and obesity in the USA push patients to use herbal remedies (8,15,20,24,27). In our study, all of the users stated that they used herbal remedies to strengthen the effect of the medications they used for headache treatment. Similar to our study, in a study conducted in Türkiye investigating the use of herbal remedies in chronic diseases, the most common reason for use was the belief that the effect of conventional medications would increase, with 39.7% (28). Herbal remedies have been widely used throughout history to prevent diseases, improve general health and treat viral infections. It can be explained that the reasons for using these remedies vary between countries and may be affected by cultural differences and personal beliefs.

This digital age, in which access to information becomes easier, changes people's tendency to decide on their own health in many aspects. In a study conducted in Germany with 2906 participants, it was reported that the most common reason affecting the participants' use of herbal remedies was the internet with 68.2%, but the trust rates in this source were at low levels with 25.4%. In the same study, it was stated that the second most common reason affecting the use of herbal remedies was pharmacists and the highest trust belonged to this source with 68.1% (20). There are publications indicating that herbal remedies are recommended by doctors in Vietnam and by relatives and neighbors in Türkiye (22,29). In our study, it was determined that the most common reason why users started using these remedies was a doctor's recommendation with 42.6% (n=20). In order to avoid potential drug-remedy interaction and possible side effects when using these remedies, use under the supervision of a healthcare professional, if possible, will prevent possible health impairment.

Studies in the literature show that consumers have exaggerated beliefs about the positive effects of herbal remedies and do not have sufficient information about the potential side effects and drug interactions of these remedies (8,25). In the study conducted in Türkiye the rate of users being informed about the side effects was 36.2%, and in the study conducted in Germany, it was determined that 38% of the users did not inform their doctors about their use of these remedies (8,16). According to the results of our study, it was determined that 29.8% (n = 14) of the participants informed their physicians that they had used herbal remedies before and the rate of knowing the side effects was 46.8% (n=22). Based on available data, it can be said that individuals are not sufficiently aware of the safety and possible side effects of herbal remedies, and this poses a significant risk, especially for the elderly population who are on medication or have multiple chronic diseases. Health professionals should actively question their patients' herbal remedy usage habits and take necessary precautions to prevent drug interactions.

Clinical Implications and Recommendations for Clinicians:

Given that a significant proportion of headache patients utilize unguided herbal remedies to enhance conventional drug efficacy without being aware of potential adverse reactions, clinicians must adopt a proactive screening approach. Healthcare providers should routinely integrate structured, non-judgmental questions regarding botanical supplement and herbal remedy use into their standard history-taking protocols, rather than relying on voluntary patient disclosure. Special clinical vigilance should be directed toward female cohorts due to their higher inclination for concurrent supplement use. Furthermore, target counseling on potential herb-drug interactions, especially involving frequently preferred agents like garlic, cinnamon, or green tea, and the deployment of accessible patient education materials in waiting areas are essential strategies to bridge the health literacy gap and ensure patient safety.

The strength of this research is that it fills a gap in the field by providing a comprehensive perspective on herbal remedy use by headache outpatient clinic visitors. The data obtained through the face-to-face survey method allowed

us to obtain important information such as which type of herbal remedies are preferred, frequency of use and gender-related differences. With the results of this study, the attitudes of patients applying to the headache clinic to use herbal remedies, their level of knowledge about side effects and other related issues were obtained, and a contribution was made to public health and literature related to potential drug-herbal remedy interactions. However, several methodological limitations must be considered when interpreting the findings of this research. First, our study population exhibited a high proportion of female participants (72.2%), which may limit the external validity and generalizability of the findings to the male population. However, it is worth noting that this gender distribution closely aligns with the established higher epidemiological prevalence and clinical consultation rates of headache disorders among women. Second, because this research was conducted as a single-center study within a specific tertiary healthcare clinic in a particular geographical region of Türkiye, its immediate generalizability to different socio-cultural settings remains limited. Third, data collection regarding the frequency and duration of herbal utilization relied on self-reported patient recall over the preceding months, which introduces an inherent risk for recall bias. Fourth, data collection via face-to-face interviews presents a potential risk for interviewer or social desirability bias, which may lead to underreporting of herbal remedy use. To mitigate this risk, interviews were conducted using a highly standardized script in a private setting, and participants were explicitly assured of complete anonymity regarding their clinical care. Nonetheless, these built-in reporting behaviors and participants' potential concerns that sharing their habits might alter their treatment plans should be considered when interpreting the overall prevalence rates. It is thought that these limitations can be overcome in future studies by using larger sample sizes, participants from different regions, and objective measurement methods.

CONCLUSION

In conclusion, this study provides a unique and pioneering contribution to the literature as the first dedicated clinical investigation to evaluate the explicit habits, recommendation sources, and safety awareness of herbal remedy use among patients attending a specialized headache clinic in Türkiye. According to our empirical findings, the most common chronic comorbidity among the participants was hypertension with 29.3% (n = 39), and the overall prevalence of herbal remedy consumption was documented as 35.3% (n = 47), with garlic being the most frequently preferred botanical agent. In alignment with cross-sectional design principles, no statistically significant association was found between herbal remedy use and sociodemographic variables such as gender or educational level.

The primary driving factor for herbal remedy consumption among users was the desire to reinforce the efficacy of prescription medications utilized for headache management , and it was revealed that individuals most frequently initiated this use based on a doctor's recommendation (42.6%, n = 20). However, a critical public health and safety gap was identified: only 46.8% (n = 22) of herbal remedy users possessed verified information regarding potential adverse outcomes, and a striking minority of only 29.8% (n = 14) voluntarily reported their herbal remedy utilization to their pain physician.

Factors such as the ease of accessibility, economic availability, and subjective consumer trust stand out as prominent elements associated with the widespread use of these natural remedies. To bridge this critical health literacy gap and mitigate the hidden risks of unmonitored herb-drug interactions, structured health education regarding the clinical risks of botanical supplements must be delivered to a broader public audience through both written and visual media channels. Crucially, healthcare providers, particularly neurologists and pain specialists, must transition to a proactive screening approach during routine history-taking to identify undisclosed herbal remedy use and integrate these potential interactive profiles into safe treatment planning. Ultimately, future multicenter studies conducted across diverse medical disciplines and encompassing varied clinical diagnoses will provide essential contributions to validating these behavioral trends on a larger scale.

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