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RESEARCH ARTICLE

Herbal Product Use and Drug-Herbal Product Interactions in Patients with Chronic Diseases-A Cross-Sectional Study

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SUMMARY

Herbal products are frequently used to prevent and treat diseases in the community. Although they are considered safe because they are natural, the simultaneous use of herbal products with drugs may cause drug-related problems and negatively affect therapeutic outcomes. Our study aimed to determine the herbal product use rates of patients with chronic diseases and the interactions of the herbal products used with drugs. This study is a cross-sectional survey conducted in a community pharmacy. The study included adult patients with chronic diseases who used regular drugs and had a history of using herbal products within the previous three months. The surveys included questions about patients' demographics, diseases, drugs, and herbal products. Drug-herbal product interactions were examined through databases, monographs, and books. 93 of 148 patients were using herbal products. Most of the patients were diagnosed with hypertension and diabetes. The use of herbal products was found to be positively correlated with undergraduate educational status, asthma, COPD, diabetes, and anxiety ($p<0.05$). The herbal product that was most used and had the most drug interactions was garlic. The majority of drug-herbal product interactions were determined by the "drugs.com" interaction checking tool and the WHO monographs. Pharmacists should provide consultancy services to their patients on the use of herbal products. It is advisable for community pharmacists to keep their knowledge on drug-herbal product interactions updated. They can benefit from training programs on drug-herbal product interactions organized by clinical pharmacists. Thus, drug-herbal product interactions that may occur in patients can be reduced.

Key Words: *Drug-herbal product interactions, clinical pharmacy, chronic disease, community pharmacy*

Kronik Hastalığı Olan Hastalarda Bitkisel Ürün Kullanımı ve İlaç-Bitkisel Ürün Etkileşimleri-Kesitsel Bir Anket Çalışması

ÖZ

Bitkisel ürünler toplumda hastalıkları önlemek ve tedavi etmek için sıklıkla kullanılmaktadır. Doğal oldukları için güvenli olarak kabul edilen bitkisel ürünlerin ilaçlarla eş zamanlı kullanımı ilaç kaynaklı sorunlara neden olabilmekte ve tedavi sonuçlarını olumsuz etkileyebilmektedir. Çalışmamızda, kronik hastalığı olan hastalarda bitkisel ürün kullanım oranları ve kullanılan bitkisel ürünlerin ilaçlarla etkileşimlerinin belirlenmesi amaçlanmıştır. Bu çalışma bir toplum eczanesinde kesitsel anket çalışması olarak yürütülmüştür. Çalışmaya kronik hastalığı olan ve son 3 ay içerisinde bitkisel ürün kullanmış olan hastalar dahil edilmiştir. Uygulanan anketlerde hastaların demografik özellikleri, mevcut hastalıkları, kullandıkları ilaçlar ve bitkisel ürünlerle ilgili sorular yer almaktaydı. İlaç-bitkisel ürün etkileşimleri ilaç veri tabanları, monografiar ve basılı kitaplar aracılığıyla incelenmiştir. Çalışmaya dahil edilen 148 hastadan 93'ünün bitkisel ürün kullandığı belirlenmiştir. Çalışmadaki hastaların çoğunun hipertansiyon ve diyabet tanılarının olduğu tespit edilmiştir. Bitkisel ürün kullanımının lisans eğitim durumu, astım, KOAH, diyabet ve anksiyete ile pozitif korelasyon gösterdiği bulunmuştur ($p<0,05$). En çok kullanılan ve en çok ilaç etkileşimi gösteren bitkisel ürünün sarımsak olduğu belirlenmiştir. İlaç-bitkisel ürün etkileşimlerinin çoğu "drugs.com" etkileşim kontrol aracı ve WHO monografı aracılığıyla tespit edilmiştir. Eczacılar, hastalarına bitkisel ürünlerin kullanımı konusunda danışmanlık hizmeti vermelidir. Toplum eczacılarının ilaç-bitkisel ürün etkileşimleri konusundaki bilgilerini güncel tutmaları tavsiye edilir. Toplum eczacıları, klinik eczacılar tarafından düzenlenen ilaç-bitkisel ürün etkileşimlerine yönelik eğitim programlarından faydalanabilirler. Böylece hastalarda oluşabilecek ilaç-bitkisel ürün etkileşimleri azaltılabilir.

Anahtar Kelimeler: *İlaç-bitkisel ürün etkileşimi, klinik eczacılık, kronik hastalık, toplum eczanesi*

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INTRODUCTION

Herbal products are one of the primary complementary and alternative treatment methods used in the treatment of diseases in the population. Herbal products are frequently preferred for the treatment of acute and chronic conditions in the population, as well as to prevent diseases and support existing drug treatments (Tulunay, Aypak, Yikilkan, & Gorpelioglu, 2015). The rate of herbal product use in the community reaches up to 80% (Ekor, 2014). Considered safe due to their natural origin, herbal products may alter the effectiveness of drugs in patients undergoing drug therapy and, when misused, may impact the prognosis of pre-existing disorders (Robinson & Zhang, 2011).

Community pharmacies serve as primary healthcare institutions offering counseling services for patients regarding their diseases and drug treatments (Abudalo et al., 2022). Due to the constraints of healthcare settings and physician workloads, patients are often unable to provide sufficient information to their physicians about their nutritional habits, use of herbal products, and drugs they use (Goldstein et al., 2007; Williams, Rondeau, Xiao, & Francescutti, 2007). This situation causes the interactions of non-pharmaceutical products used by patients with prescribed drugs to be ignored.

Clinical pharmacy is defined as; "… a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention" (ACCP, 2008). The consultancy services provided by clinical pharmacists to healthcare personnel on issues such as drug selection, dosage adjustment, drug interactions, side effects, toxicity, and therapeutic drug monitoring contribute to improving treatment outcomes (ACCP, 2023). The services provided by clinical pharmacists contribute to the prevention and solution of medication-related problems (Abunahlah, Elawaisi, Velibeyoglu, & Sancar, 2018; Polat, Koc, & Demirkan, 2022). Additionally, In addition to consultancy services, clinical pharmacists contribute to increasing the knowledge level of pharmacists through professional training (Hersberger & Messerli, 2016). In-service training provided by clinical pharmacists to community pharmacists will help reduce the incidence of drug-related problems. Drug-related problems are a common issue in treatment that can negatively affect patients' response to therapy, increase morbidity and mortality rates, and escalate treatment costs (Abunahlah et al., 2018). Drug-herbal product interactions have a special place among the factors that cause drug-related problems in patients. These interactions may either reduce drug efficacy or enhance drug toxicity and adverse effects. Drug-herbal product interactions are neglected in routine treatment and have a negative impact on therapeutic outcomes. Several factors contribute to these interactions, such as patients' failure to inform physicians, pharmacists, and other healthcare providers about the herbal products they take and healthcare providers' lack of sufficient knowledge about herbal product-drug interactions (Ahmed et al., 2021; Parvez & Rishi, 2019). Investigating the effect of herbal products that patients use in conjunction with drug treatments will help to improve patient safety and treatment outcomes. Therefore, our study aimed to determine the prevalence of herbal product use in patients with chronic diseases and the potential interactions between the patients' drugs and the herbal products they use.

MATERIAL AND METHOD

The study was designed as a cross-sectional descriptive survey conducted in a community pharmacy in Erzincan, Turkey, between April and September 2023. The pharmacy is located near the family health center. The study included adult patients with chronic diseases who consented to participate, used regular drugs to treat these conditions and had a history of using herbal products within the previous three months. Patients who did not give consent to participate in the study and who did not have chronic diseases were excluded from the study. The research team comprised one faculty member from the Department of Clinical

Pharmacy and one faculty member from the Department of Pharmacognosy. The structured survey questions were developed by the researchers and reviewed by three field experts to ensure content and face validity. After incorporating the necessary revisions, the final version of the survey was created. The survey included 5 open-ended and 10 closed-ended questions. The research team administered it to patients face-to-face. In addition to the demographic data of the patients, the surveys included questions about patients' existing diseases, the use of medicines and herbal products. Medscape®, drugs.com, and UpToDate® databases were used to determine the interactions between drugs and herbal products. In addition, Physicians' Desk Reference (PDR), World Health Organization (WHO) and Turkish Pharmacognosy and Phytotherapy Association (FFD) monographs, Novel Drug Target With Traditional Herbal Medicines and Kanıta Dayalı Fitoterapi-I books were used to detect drug-herbal product interactions. Drug-herbal product interactions were investigated by the clinical pharmacist in the research team. This study was approved by the Erzincan Binali Yildirim University Health and Sports Sciences Ethics Committee with the decision dated 31.03.2023 and numbered 03/06.

Statistical analysis

The sample size targeted in the study, based on the studies in the literature, a total of 103 patients were determined with a power level of 90% and an error level of 5%, with the prediction that the herbal product use prevalence of the patients planned to be included in the study would be 40% (Tulunay et al., 2015; Turkmenoglu, Kutsal, Dolgun, Diker, & Baydar, 2016). The sample size was calculated with G-power v3.1.9.7 software. Student's t-Test was used in the analysis of continuous parametric variables where normal distribution conditions were met, and Mann Whitney U Test, which is the non-parametric counterpart of this test, was used in cases where normal distribution conditions were not met. Analysis of categorical data was done with the Chi-Square Test. The relationship between patients' herbal product use and gender, educational status, and comorbid diseases was examined with binary logistic regression analysis. Statistical analyses were performed with IBM SPSS v22.0 software. Statistical significance was accepted as $p<0.05$.

RESULTS AND DISCUSSION

Drug-related problems are defined as an event or situation that prevents or has the potential to prevent drug therapy from achieving the desired therapeutic results. Drug-related problems result in increased morbidity and mortality rates for patients, as well as increased treatment costs. Clinical pharmacists play a key role in the prevention, identification, and management of drug-related problems. One of the factors that cause drug-related problems to be observed in patients is drug-herbal product interactions (Abunahlah et al., 2018; Polat et al., 2022). The perception that herbal products are safe because they are natural contributes to their widespread use in society. However, the unconscious use of herbal products poses potential risks to patient health. In particular, the simultaneous use of herbal products and prescription drugs can alter the effects of the medication and lead to adverse drug reactions. Studies indicate that the usage rate of herbal products worldwide reaches up to 80% (Ekor, 2014). The high rate of herbal product use among the public also increases the likelihood of drug-related problems being observed.

The pharmacy, where our study was carried out, is mostly visited by patients with chronic diseases (such as hypertension, diabetes, and coronary artery disease). The pharmacy staff consists of one pharmacist and one pharmacy technician. On average, the pharmacy fills 150 prescriptions per day.

A total of 148 patients were included in the study. Demographic data of patients are presented in Table 1. The percentage of patients using herbal products was 62.84% (n=93). Previous studies have reported herbal product usage rates of 29% and 56.6% in patients with chronic conditions (Tulunay et al., 2015; Welz, Emberger-Klein, & Menrad, 2019). In another study, the

herbal product use rate of patients was reported to be 62.9%, similar to our results (Souza-Peres et al., 2023).

In our study, the mean age (mean±SD) of the patients was 56.61±11.470 years, while the mean age of patients using herbal products was 55.59±10.204 years (p>0.05). The median (minimum-maximum) number of drugs used by the patients included in our study was 2 (1-7), and for those using herbal products, it was 2 (1-6). The number of male patients was more than the number of female patients (n=78, 52.70% and n=70, 47.30%, respectively) (p>0.05). Among the patients using herbal products, 48 (51.61%) were male and 45 (48.39%) were female (p>0.05) (Table 1).

The average age of the patients in our study with a history of herbal product use was similar to the previous study (56.4±9.9) (Tulunay et al., 2015). However, some studies have reported higher usage rates of herbal products in female patients, contrary to our results (Al-Windi, 2004; Grymonpre, McKechnie, & Briggs, 2010; Peltzer & Pengpid, 2019; Tezcan & Butur, 2022; Ünlüyol et al., 2023). Differences in the patient populations and the geographic locations where the studies were conducted likely account for these variations.

The majority of patients using herbal products were elementary school graduates (n=30, 32.26%). In addition, the educational level of patients using herbal products was statistically different from those not using them (p<0.05) (Table 1). Statistical analysis was carried out to determine the impact of education level on the use of herbal products by patients. The use of herbal products and undergraduate patients' educational status were found to be positively correlated and statistically significant (OR: 6.50; 95% CI: 1.39-30.49; p=0.018) (Table 2). Previous studies have reported similar findings (Abunahlah et al., 2018; Al-Windi, 2004; Peltzer & Pengpid, 2019; Pradipta et al., 2023; Ünlüyol et al., 2023). In a study on patients with chronic conditions found that herbal product use increased with education level (p<0.05) (Pearson et al., 2018). These data show that herbal product use rates increase with higher levels of education.

Table 1. Demographic data of patients

	Patients who do not use herbal products (n=55)	Patients who use herbal products (n=93)	Total (n=148)	p
Age (year), (mean±SD)[a]	58.35±13.26	55.59±10.20	56.61±11.47	0.118
Sex, n (%)[b]; Female Male	 25 (45.45) 30 (54.55)	 45 (48.39) 48 (51.61)	 70 (47.30) 78 (52.70)	 0.730
Rate of cigarette use, n (%)[b]	10 (18.18)	30 (32.26)	40 (27.03)	0.062
Rate of alcohol use, n (%)[b]	4 (7.27)	7 (7.53)	11 (7.43)	1.00
Educational status, n (%)[b]; Illiterate Literate Elementary school High school Undergraduate Postgraduate and Doctorate	 7 (12.73) 12 (21.82) 16 (29.09) 4 (7.27) 10 (18.18) 6 (10.91)	 5 (5.38) 6 (6.45) 30 (32.26) 26 (27.96) 20 (21.51) 6 (6.45)	 12 (8.11) 17 (11.49) 46 (31.08) 30 (20.27) 30 (20.27) 12 (8.11)	 **p=0.004**
Drug groups, n (%)[c]; Cardiovascular System Drugs Antidiabetic Drugs Respiratory System Drugs Central Nervous System Drugs Haematologic Drugs Other	 41 (35.04) 37 (31.62) 13 (11.11) 12 (10.26) 2 (1.71) 12 (10.26)	 99 (52.38) 40 (21.16) 8 (4.23) 6 (3.17) 14 (7.41) 22 (11.64)	 140 (45.75) 77 (25.16) 21 (6.86) 18 (5.88) 14 (7.41) 34 (11.11)	 **0.048** **0.019** **0.031** **0.006** **0.044** >0.05
Diseases, n (%)[b]; Hypertension Diabetes Benign Prostatatic Hyperplasia Dyslipidemia Psychiatric Disease Heart Failure Asthma and Chronic Obstructive Lung Disease Other	 21 (21.86) 31 (32.29) 4 (4.17) 5 (5.21) 8 (8.33) 3 (3.13) 7 (7.29) 17 (17.71)	 48 (33.33) 35 (24.31) 14 (9.72) 12 (8.33) 5 (3.47) 11 (7.64) 4 (2.78) 15 (10.42)	 69 (28.75) 66 (28.5) 18 (7.5) 17 (7.08) 13 (5.42) 14 (5.83) 11 (4.58) 32 (13.33)	 0.113 **0.027** 0.162 0.482 0.204 0.20 0.118 >0.05

[a] Student's T Test, [b] Chi-Squared Test, [c] Mann Whitney U Test

Table 2. The relationship between the educational status of patients and the use of herbal products

Education Status	OR	OR (%95 CI)		p
		Min	Max	
Illiterate	-	-	-	**0.09**
Literate	0.714	0.143	3.579	0.682
Elementary school	0.500	0.112	2.234	0.364
High school	1.875	0.519	6.771	0.337
Undergraduate	6.500	1.386	30.487	**0.018**
Postgraduate and Doctorate	2.000	0.512	7.813	0.319

The majority of the patients in the study were diagnosed with hypertension and diabetes (n=69 (28.75%) and n=66 (28.50%), respectively). The prevalence of diabetes was statistically significantly higher in patients using herbal products than in patients without a history of using herbal products ($p<0.05$) (Table 1). Similar to our results, it has been reported that hypertension and diabetes diagnoses come to the fore among patients with a history of herbal product use (Peltzer & Pengpid, 2019; Tulunay et al., 2015). When the impact of patients' chronic diseases on their herbal product usage preferences was

analyzed, a significant and positive relationship was found between the diagnoses of diabetes (OR: 5.74; 95% CI 2.01-16.37; p=0.001), anxiety (OR: 10.42; 95% CI 1.27-85.61; p=0.029), asthma and Chronic obstructive lung disease (COPD) (OR: 8.27; 95% CI 1.36-50.17; p=0.022) and the rates of herbal product use (Table 3). The number of studies investigating the relationship between patients' use of herbal products and their existing diseases is limited in the literature. In a study, it was determined that there was a positive and significant relationship between asthma, arthritis, cancer, cardiac diseases, dyslipidemia, hypertension, migraine, and gastrointestinal system diseases and patients' use of herbal products ($p<0.05$) (Peltzer & Pengpid, 2019). However, in contrast to our results, there was no significant relationship between diabetes, anxiety, and herbal product use in this study ($p>0.05$). The fact that the studies were conducted in different patient populations explains the variation in the reported results.

Table 3. The relationship between the diseases of patients and the use of herbal products

Disease	OR	OR (%95 CI)		p
		Min	Max	
Asthma and Chronic Obstructive Lung Disease	8.265	1.361	50.173	**0.022**
Depression	0.950	0.112	8.030	0.962
Hypertension	0.973	0.355	2.667	0.958
Diabetes	5.738	2.011	16.371	**0.001**
Hypothyroidism	1.475	0.099	21.978	0.778
Parkinson's Disease	9347983460.403	0	-	1.000
Heart Failure	0.232	0.042	1.281	0.094
Benign Prostatatic Hyperplasia	0.671	0.168	2.676	0.571
Dyslipidemia	0.688	0.188	2.515	0.572
Epilepsy	9098014877.572	0	-	0.999
Ankylosing spondylitis	0.000	0	-	1.000
Chronic Venous Insufficiency	3172540955.156	0	-	0.999
Pulmonary Embolism	0	0	-	0.999
Anxiety	10.421	1.269	85.606	**0.029**
Neuropathy	191864126.318	0	-	1.000
Rheumatoid Arthritis	1.069	0.079	14.394	0.960
Familial Mediterranean Fever	0	0	-	1.000
Lupus Erythematosus	9347979125.376	0	-	1.000
Psoriasis	873020163.740	0	-	1.000
Cancer	1585688405.889	0	-	1.000
Kidney Stone	0	0	-	1.000
Peptic Ulcer	2.893	0.218	38.396	0.421
Gastroesophageal Reflux Disease	1.768	0.057	54.688	0.745
Bipolar Disease	6339476654.783	0	-	1.000
Osteoporosis	2.867	0.222	36.957	0.419
Neurogenic Bladder	1100838317.606	0	-	1.000

Cardiovascular drugs were the most commonly used drugs among the patients in our study (n=140, 45.75%). The rates of the use of cardiovascular system, antidiabetic, respiratory system, central nervous system, and hematological system drugs were statistically significantly different between patients with and without a history of herbal product use ($p<0.05$) (Table 1). It was determined that cardiovascular (n=99, 52.38%) and antidiabetic drugs (n=40, 21.16%) were mostly used in patients with a history of herbal product use. Consistent with our findings, it has been shown previously that cardiovascular system and antidiabetic drugs were mostly used in patients with chronic diseases who used herbal products (Albassam et al., 2021).

Patients with a history of herbal product use in the past three months most frequently used Garlic, Olive Leaf, Turmeric, and Saw Palmetto (Table 4). It was determined that 76.34% (n = 71) of the patients with a history of using herbal products used these products every day. While different studies have reported varying herbal product usage rates among chronic disease patients, the increased use of Garlic is particularly notable (Grymonpre et al., 2010; Mazrouei et al., 2022; Olisa & Oyelola, 2010; Tulunay et al., 2015; Ünlüyol et al., 2023). These differences likely stem from a combination of traditional influences and variations in study populations.

Table 4. Herbal products most used by patients in the last 3 months

Herbal products	**n (%)**
Garlic	17 (14.05)
Olive Leaf	10 (8.26)
Turmeric	10 (8.26)
Saw palmetto	10 (8.26)
Hawtorn	8 (6.61)
Ginger	6 (4.96)
Green tea	6 (4.96)
Parsley juice	6 (4.96)
Lemon juice	5 (4.13)
Licorice root	4 (3.31)
Nettle seed	4 (3.31)
Sambucus nigra	4 (3.31)
Black cumin oil	4 (3.31)
Cinnamon juice	4 (3.31)
Other	23 (19.01)

When the patients' answers to the survey questions were analyzed, 81 (87.10%) patients stated that they knew the content of the herbal product they used. The majority of patients stated that they thought herbal products would not have harmful effects on health (n=60, 64.52%). Additionally, 74 (79.57%) patients stated that herbal products and drugs had similar success rates in treating diseases (Table 5). In a study, the majority of patients stated that herbal products were effective in treating diseases. In the same study, more than half of the patients thought that herbal products were harmless (Ünlüyol et al., 2023). In another study, patients stated that herbal products were more effective and safer than drugs (Mazrouei et al., 2022). The belief that herbal products are harmless contributes to their high prevalence of use in populations.

Table 5. Patients' answers to survey questions

Questions	n (%)
Do you know the ingredients of the herbal product you use?	
No	12 (12.90)
Yes	81 (87.10)
Have you used herbal products with your drugs?	
No	0 (0)
Yes	91 (97.85)
I don't remember	2 (2.15)
Can herbal products be harmful to your health?	
Yes, it can be harmful.	22 (23.66)
No, I don't think herbal products can be harmful.	60 (64.52)
I have no idea.	11 (11.83)
How did you make your decision to use herbal products?	
My physician recommended.	13 (13.98)
My pharmacist recommended.	2 (2.15)
I decided to use it after watching it on TV.	11 (11.83)
I decided to use it after seeing the posts on social media.	45 (48.39)
I decided to use it on the advice of my family/friends/relatives.	9 (9.68)
Other	13 (13.98)
Do herbal products have the same success as drugs in treating diseases?	
No	5 (5.38)
Yes	74 (79.57)
I have no idea	14 (15.05)

It is noteworthy that most of the patients selected the option "I decided to use herbal products after seeing them in social media posts" when asked to find out how the patients decided to use herbal products (n=45, 48.39%) (Table 5). Studies have reported that different factors such as physician/pharmacist recommendations, family members' recommendations, television programs, and social media posts play a role in patients' decisions to use herbal products (Albassam et al., 2021; Mazrouei et al., 2022; Tulunay et al., 2015; Ünlüyol et al., 2023). In our study, social media channels -which are becoming increasingly influential in our daily lives- play an active role in patients' decision to use herbal products.

In the literature, studies investigating the interactions between herbal products and drugs are limited compared to those examining drug-drug interactions. This lack of research increases the likelihood of unexpected treatment outcomes, particularly in patients using herbal products alongside drugs. In our study, potential interactions between herbal products and patients' drugs were examined using databases and monographs. In our study, the majority of drug-herbal product interactions were identified using the "drugs.com" interaction checker (n=57). Most potential drug-herbal product interactions (n=29) were at the "moderate" level. The monograph in which drug-herbal product interactions were most frequently detected was the WHO monograph (n=34) (Table 6). The herbal product with the most potential drug interactions detected in both drugs.com and WHO monographs was Garlic (n=21 and n=18, respectively). In a study examining drug-herbal product interactions, it was reported that most of the interactions detected were at a moderate level, similar to the results in our study (Albassam et al., 2021). Studies assessing drug-herbal product interactions that used monographs were absent from the literature. In addition, the identified potential drug interactions do not always make sense of clinically. Generally, moderate, majör, or contraindicated drug interactions are clinically significant (Rodrigues et al., 2015).

Table 6. Drug-herbal products interactions

Interaction Control Source	Number of Interaction (n)
UpToDate (Lexicomp)	32 (total) 29 (monitor therapy) 3 (no action needed)
Medscape	16 1 (serious) 13 (monitor closely) 2 (minor)
drugs.com	57 1 (major) 29 (moderate) 27 (minor)
WHO monographs	34
PDR	30
Kanıta Dayalı Fitoterapi-I	31
Novel Drug Target With Traditional Herbal Medicines	4
FFD monographs	4

Garlic was the herbal product that most frequently interacted with drugs in our study, particularly with antihypertensive, antiplatelet, and antidiabetic drugs. In a study, it was stated that Garlic potentiates the antiplatelet effect of aspirin (Souza-Peres et al., 2023). Garlic was found to enhance the effects of captopril in an animal study investigating the antihypertensive properties of Garlic (Asdaq & Inamdar, 2010). Additionally, studies on both humans and animals have demonstrated that Garlic improves the effects of hypoglycemic drugs (Hu et al., 2005). Due to its various pharmacological effects, patients taking cardiovascular or endocrine system drugs should be warned about using garlic.

This study has several limitations. As the study was limited to one community pharmacy, it was mandatory to work together with patients who shared a similar demographic. Expanding the study to include community pharmacies in various locations would increase the number of participants and allow for the examination of patients with more different profiles. Another limitation was the limited number of studies on drug-herbal product interactions. Finally, since the interactions identified by drug interaction tools are potential drug-herbal product interactions, they may not always have clinical significance.

CONCLUSION

Our findings show that herbal products used in patients with chronic diseases are not always safe and may even interact with the drugs used and cause life-threatening adverse drug reactions in patients. It is particularly important to investigate about herbal product use in patients taking cardiovascular or antidiabetic medications who visit pharmacies, to evaluate potential interactions between herbal products and their medications, and to provide appropriate guidance to these patients. Pharmacists should provide consultancy services to their patients on the use of herbal products. It is advisable for community pharmacists to keep their knowledge on drug-herbal product interactions updated. They can benefit from training programs on drug-herbal product interactions organized by clinical pharmacists.

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AUTHOR CONTRIBUTION STATEMENT

Developing hypothesis: EP. Methodology: EP. Survey question: EP and SG. Implementation of surveys: SG. Data management: EP and SG. Statistics, analysis and interpretation of the data: EP. Writing — original draft: EP. Writing — reviewing and editing: EP and SG.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

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